DECEMBER 1950

The Paper Industry

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4-Stage Pulp Washing with 2 Drums

CLEANER STOCK
LESS DILUTION
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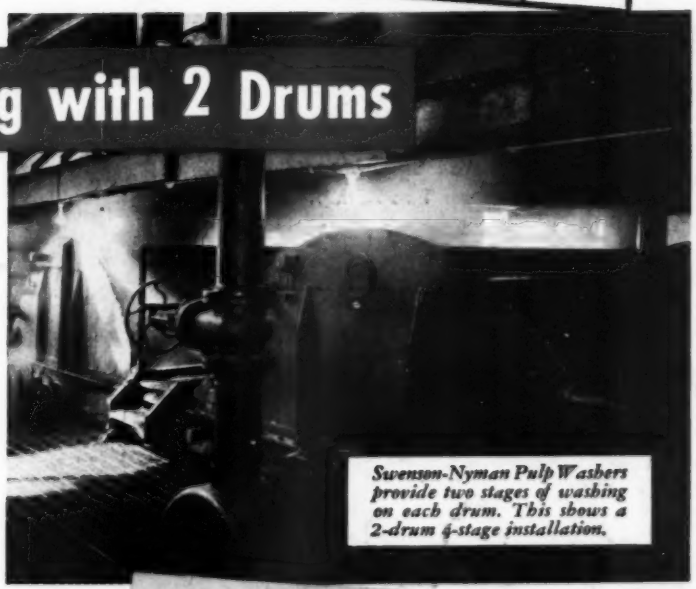
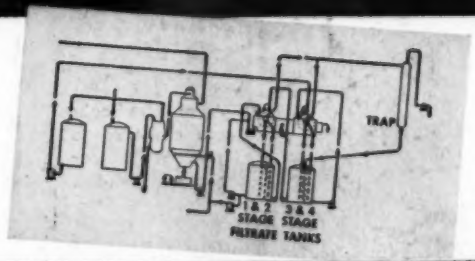


Swenson-Nyman Pulp Washers provide two stages of washing on each drum. This shows a 2-drum 4-stage installation.

wenson-Nyman Pulp Washers have these outstanding features . . .

- Two-stage countercurrent washing on each drum
- Strong and weak liquors handled separately
- Independently controlled vacuum on each stage
- Uniform distribution of vacuum across entire sheet
- Pulp picked up at low submergence level
- Uniform pickup and sheet formation
- Large washing area—twice sheet-forming area
- Low point of sheet discharge—at centerline of drum



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reach for this

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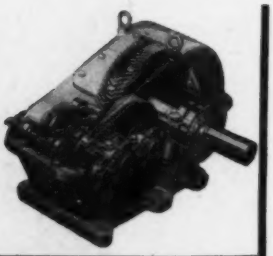

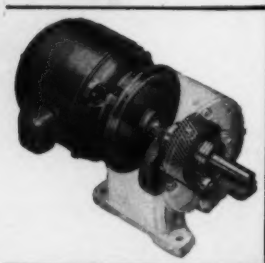

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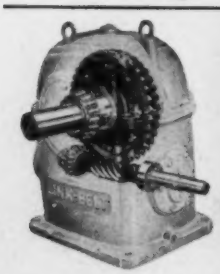

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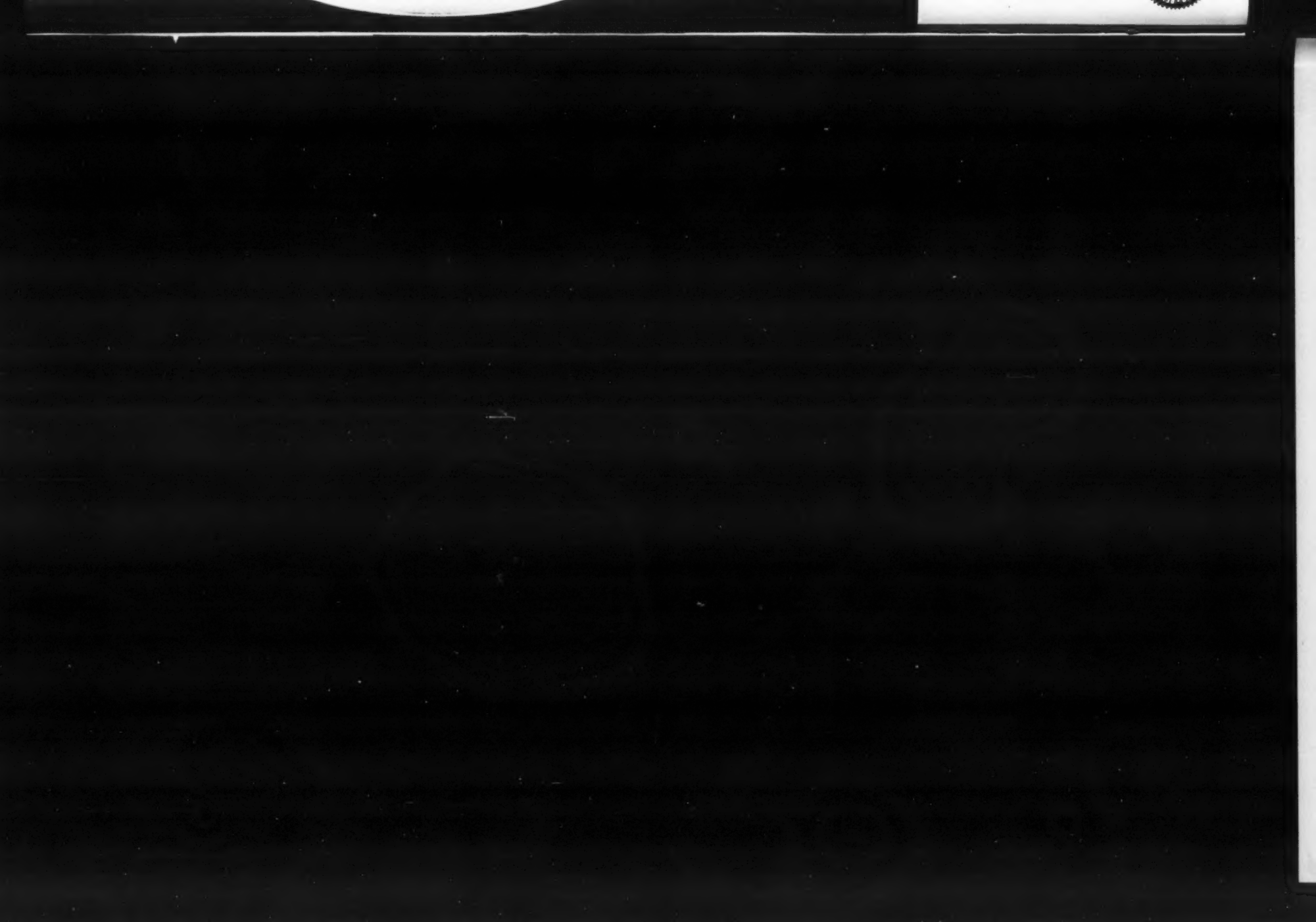

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Illustrated Story of Beloit
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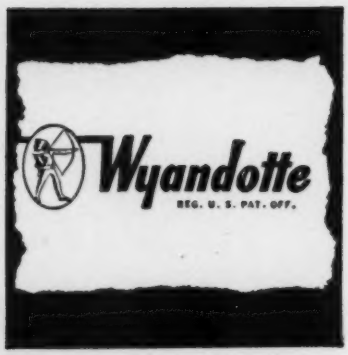

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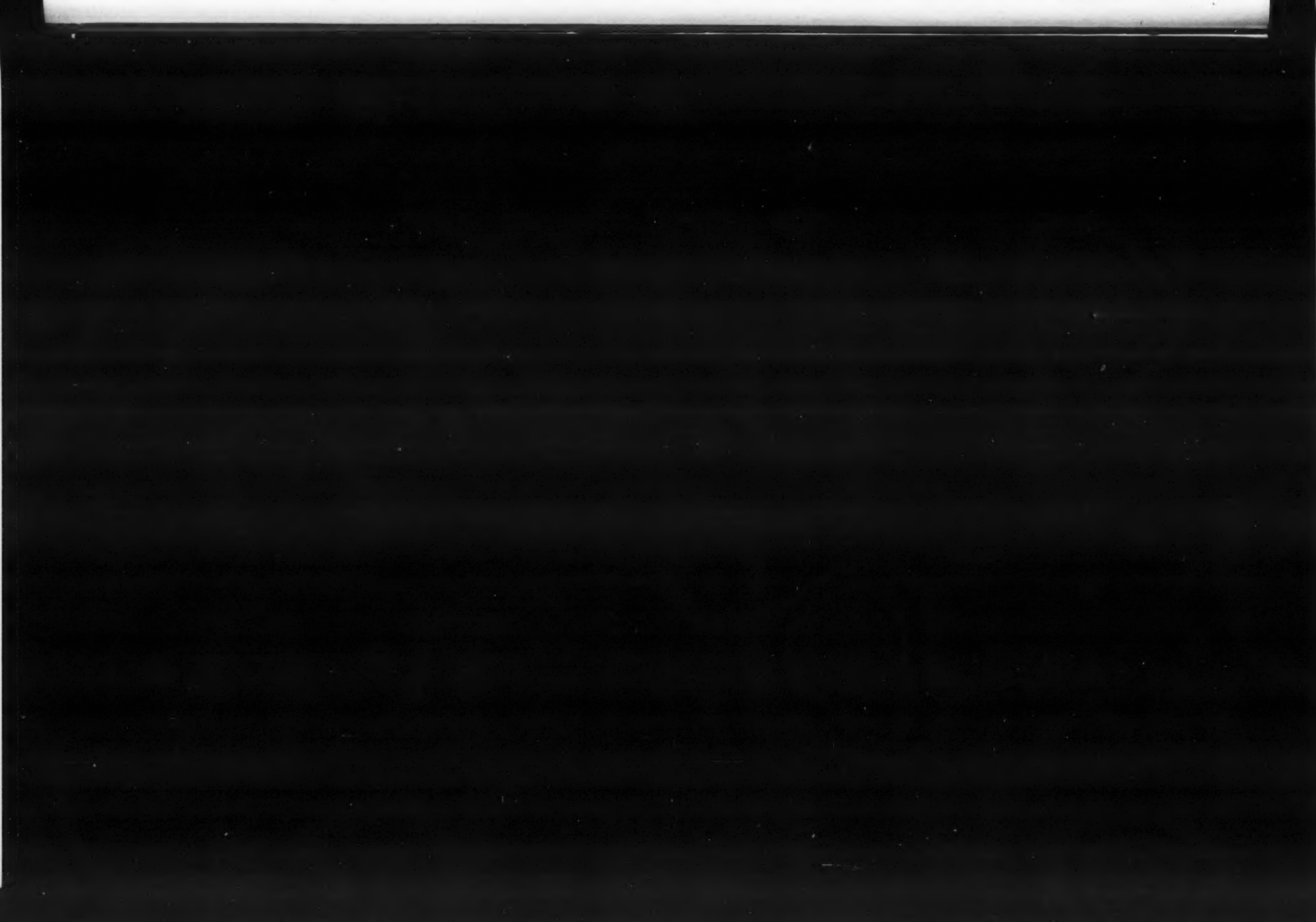

The Paper Industry

Technology • Engineering • Management • Production

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THE PAPER INDUSTRY is indexed regularly in Engineering Index and Industrial Arts Index. An index to each volume is issued annually by the publisher as a part of the April number.

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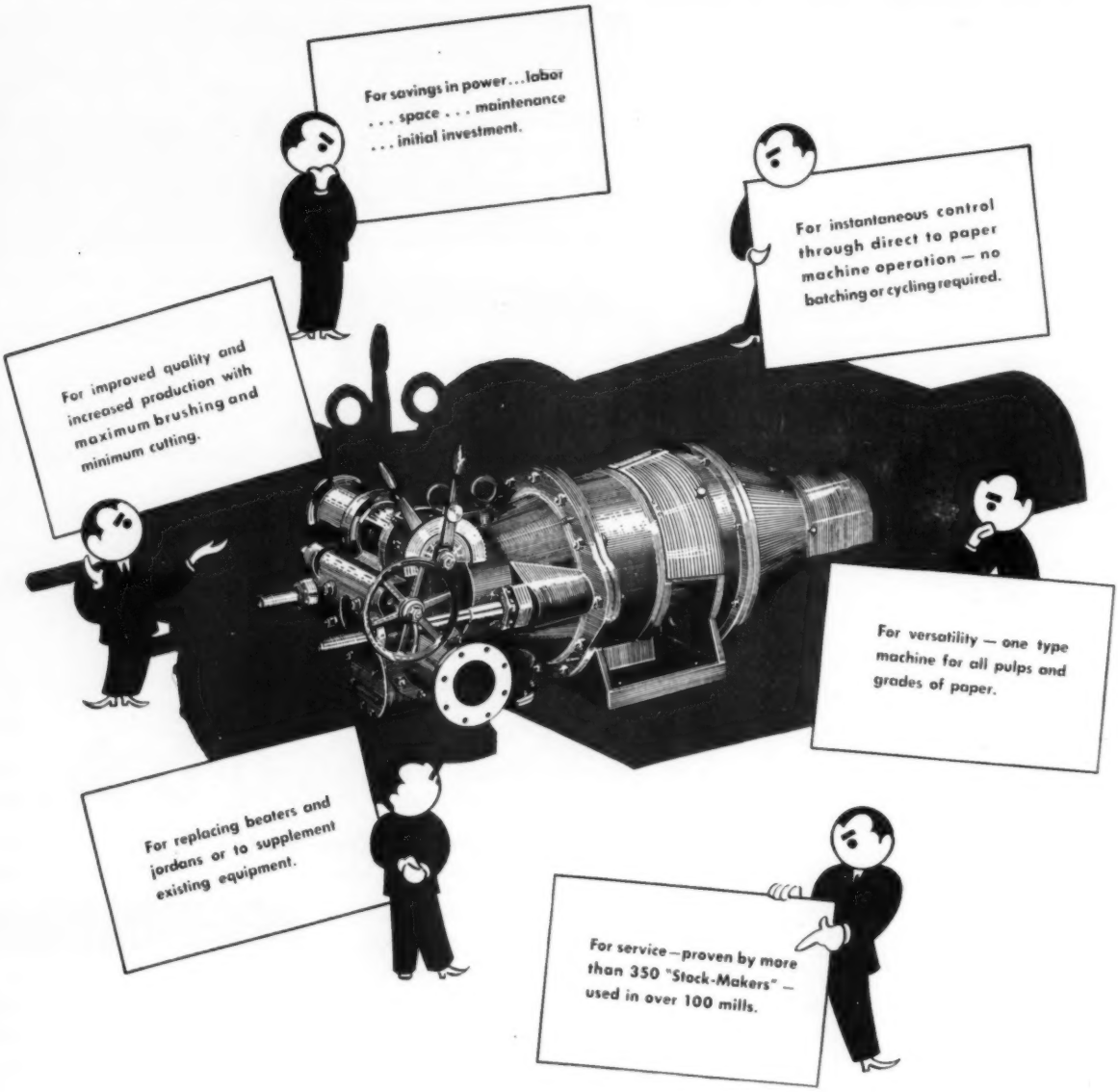
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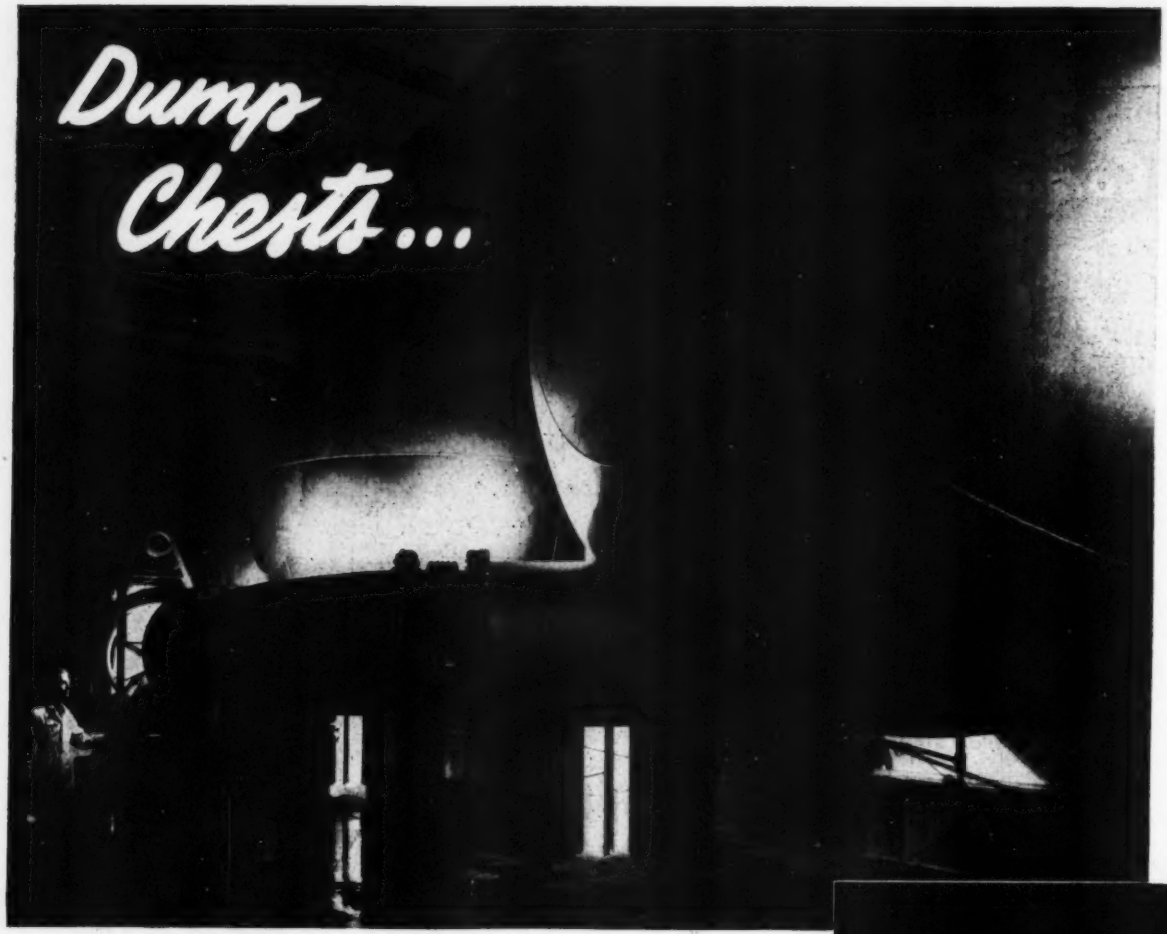

at a Washington pulp mill

The gracefully-curved modernistic steel plate structures shown in the above view are pulp dump chests at the Weyerhaeuser Timber Company's pulp mill at Longview, Washington. Sulphite waste liquor is used to wash pulp from the digesters into these dump chests.

The four 16-ft. diam. by 71-ft. chests were fabricated at our Chicago plant and erected at Longview by one of our experienced field crews. Each one is supported by two ring girders spaced 37 ft. apart. The base of one girder on each vessel is fixed, the other moves as the shell expands and contracts. Each chest has a 40-in. pipe connection in each end and one 8-in. and one 20-in. nozzle at the top. All of the chests have acid-resisting linings.

These dump chests are typical examples of the steel plate structures we fabricate and erect. Some of our other products include: flat-bottom steel tanks, elevated steel tanks, acid accumulators, digesters, blow tanks, pressure vessels and salt cake tanks. Write our nearest office for estimates the next time you need steel plate structures of any type.

This view illustrates the workmanship required to shape heavy plates and the carefully-welded joints that are so important in building field-erected pressure vessels.

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The illustration above shows P.P.&E. high pressure, high temperature piping being tested by means of a Reflectoscope which produces pulses of vibration waves of a frequency above hearing and transmits them at an angle into the metal through a searching unit which contains a sensitive quartz crystal.

The slightest discontinuity in the metal interrupts transmission of the waves, reflecting them back to the searching unit where the crystal converts mechanical vibrations into electrical energy. This voltage, amplified in the receiver, produces a visual indication of the defect on the screen of a cathode ray tube.

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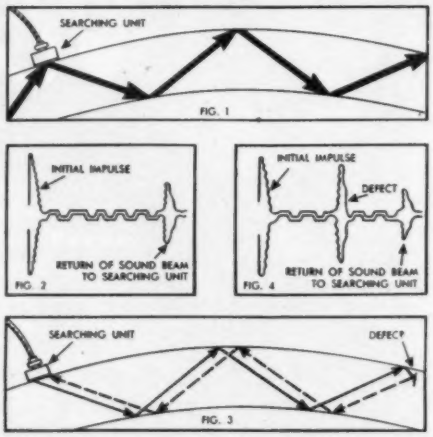
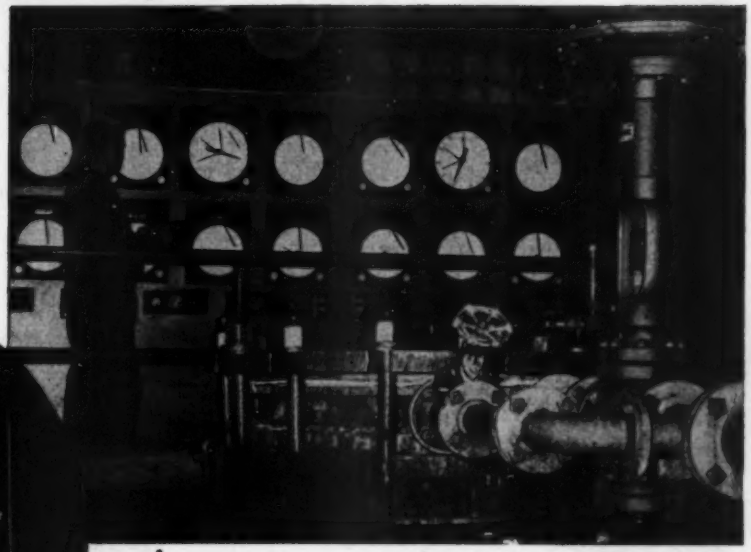
How the "*Ultrasonic*" Eye Works



Intermittent ultrasonic vibrations are transmitted angularly into the section under inspection, so that each sound beam is reflected away from its point of origin progressively from inner to outer pipe wall surface in a consistent pattern, as shown in Fig. 1, until it circles the pipe and returns to the searching unit. The uninterrupted flow and return of the beam is indicated on the oscilloscope screen as diagrammed in Fig. 2. Any discontinuity in the metal lying in the path of the sound beam will interrupt transmission as shown in Fig. 3, reflect the sound back to the searching unit, and provide a visual indication of its presence and location on the oscilloscope screen (see Fig. 4).

TO DIGESTERS...



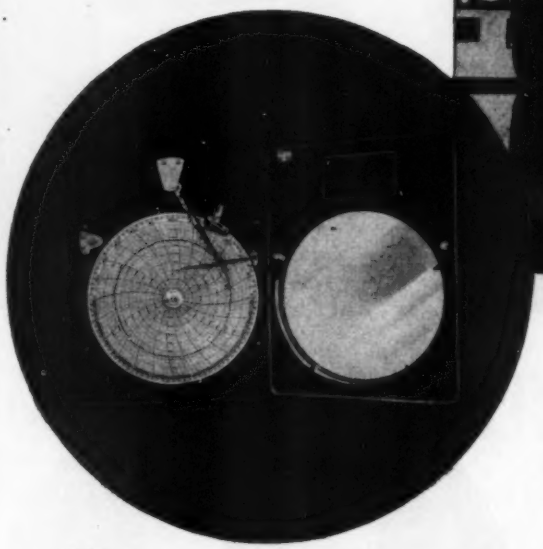


Photo courtesy of Oxford Paper Co., Rumford, Maine

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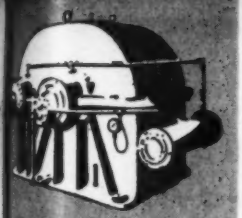
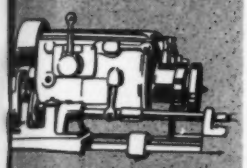
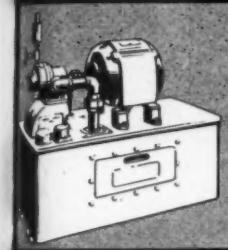


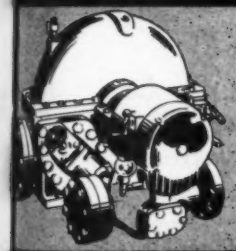
SPEED REDUCER



AD STOCK GEARS



DRAULIC SYSTEM



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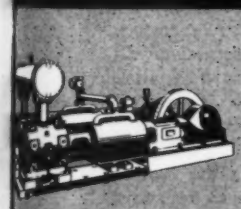
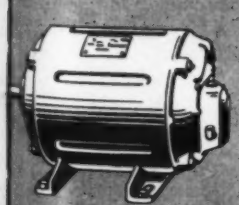


COMPRESSOR



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At the left are shown several types of equipment in which the new STANOILS can save you money and maintenance time. A Standard Oil lubrication specialist will help you find still other applications where versatile STANOILS can replace many special-purpose oils. You can reach this man quickly and easily through your local Standard Oil Company (Indiana) office. Contact him today. Or, if you wish, write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

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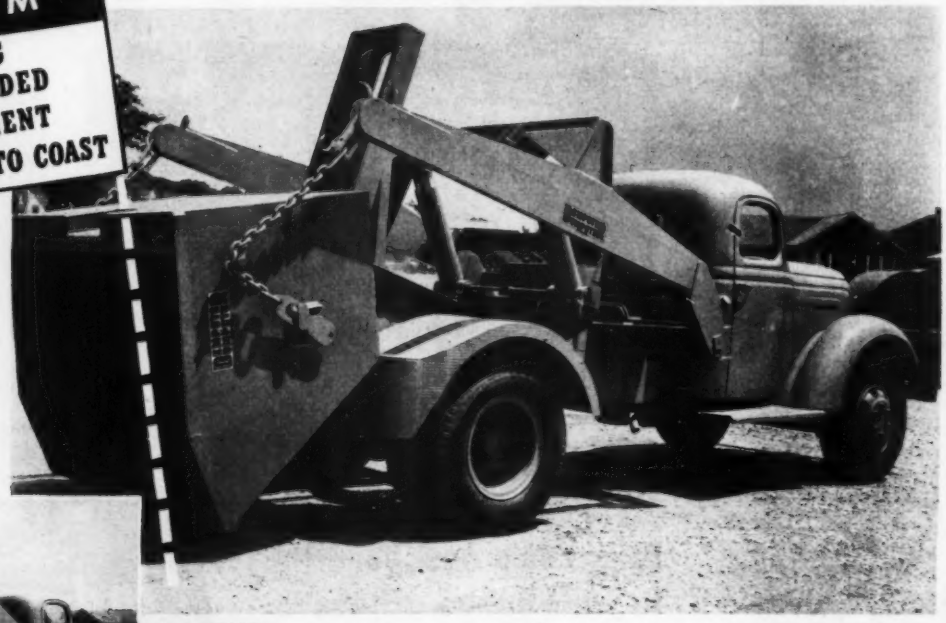
. . . handling bulk materials of every description at phenomenal savings



Photos show the three simple stages of servicing a container. The Dempster-Dumpster, operated from hydraulic controls by driver in the cab, picks up each container and hauls it to point of disposition where it may be dumped or set down intact.

★ WVPCO – *recognized across the nation*

. . . West Virginia Pulp and Paper Co., well known for sound management, uses the Dempster-Dumpster System

West Virginia Pulp and Paper Co. is among the hundreds of cost minded manufacturers, both large and small, using the Dempster-Dumpster System of bulk materials handling . . . the system recognized across the nation for its efficiency and ability to reduce costs.

Instead of operating several conventional trucks one truck alone can service any number of detachable containers, ranging up to 12 cu. yds. payload with the Dempster-Dumpster System. With this modern system of bulk materials handling, truck never stands idle to be loaded. One truck mounted Dempster-Dumpster, with only one man, the driver, is kept busy picking-up, hauling and dumping one pre-loaded container after another. Containers are spotted inside and outside your plant. They are built in a wide variety of designs best suited to the type of materials handled—be they bulky, light or heavy . . . solids or liquids . . . trash or rubbish.

The Dempster-Dumpster System cuts man-hours . . . reduces truck investment, gas, oil, maintenance costs . . . improves "housekeeping" methods . . . reduces fire hazards . . . provides an easier, quicker, safer and more efficient manner of handling materials. It will pay you to investigate the Dempster-Dumpster System now! A product of Dempster Brothers, Inc.

One Dempster-Dumpster Services All Containers. . . All Designs. . . All Sizes

DEMPSTER BROTHERS, 7120 Dempster Building, Knoxville 17, Tennessee

POWELL VALVES

the top choice of American Industry

Powell Makes a Complete Line* of Valves especially adapted to meet the flow control requirements of YOUR industry.

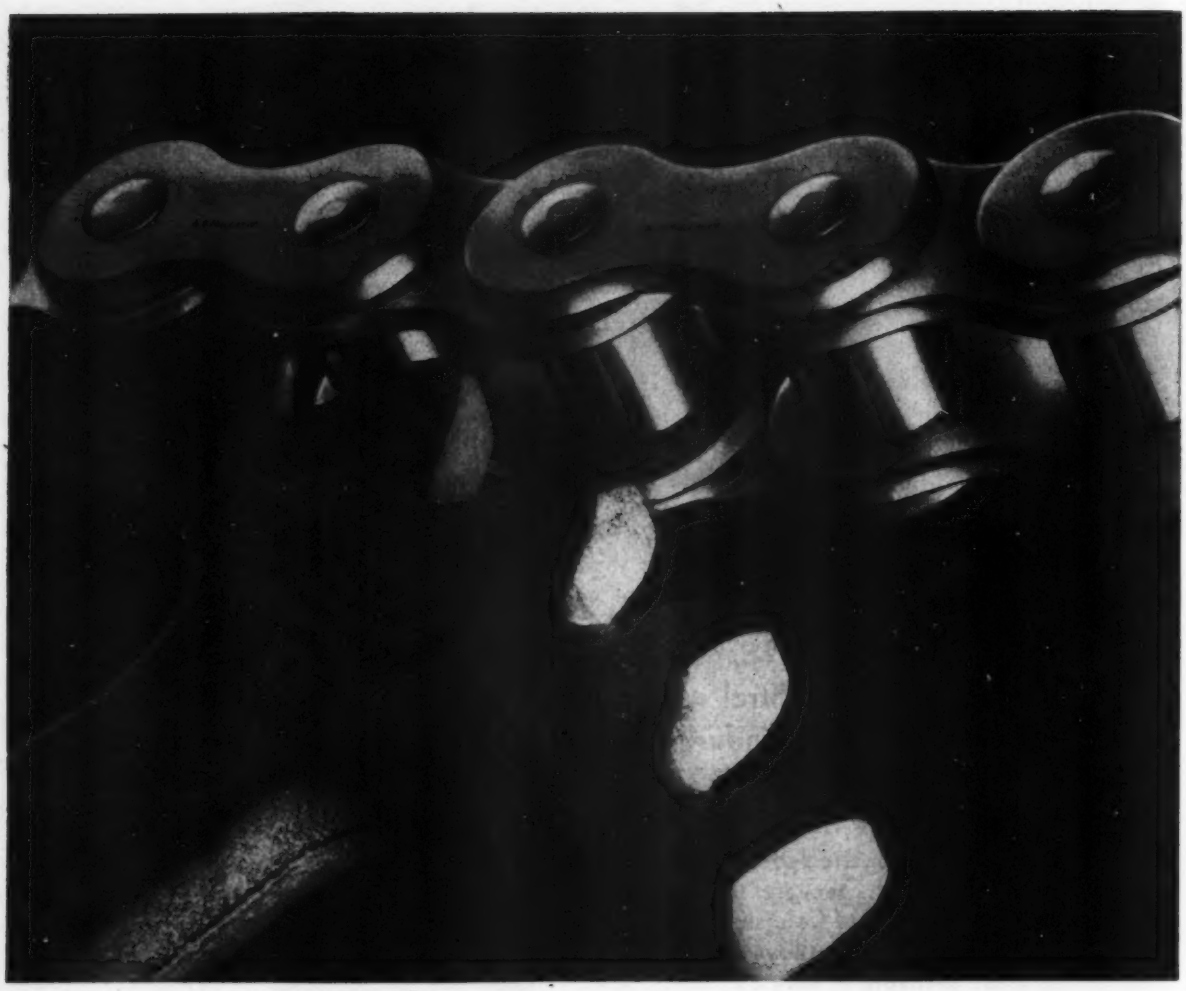
This 1500-pound Cast Steel Pressure Seal Gate Valve with an electric motor operator is one of many Powell designs for the modern Power Plant.

*The Complete Line includes valves in Bronze, Iron, Steel and the widest selection of Corrosion-Resisting metals and alloys ever made available to Industry.

Quality fine throughout "The Line"

POWELL

The WM. POWELL CO., 2525 Spring Grove Ave., P. O. Box 106, Station B, Cincinnati 22, Ohio



A Portrait of Drive Efficiency and Savings

Whitney Chain Drives cut transmission costs, provide positive grip, assure product uniformity

Here's a close-up view of a Whitney Roller Chain engaging a sprocket tooth. Examine it carefully . . . by looking a little deeper, you can see power transmission efficiency and cost reducing design elements at work. Note the finely finished alloy steel rollers settling down to a positive, yet smooth engagement with the sprocket teeth . . . that's the all-steel combination, supplying the answer to countless drive problems.

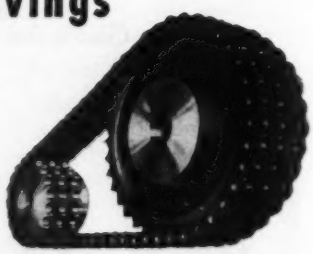
Here are some of the reasons why:

Positive Grip — Deeply seated in the sprocket teeth, Whitney Roller Chains transmit full rated horsepower without friction or slippage. This means constant machine output is maintained . . . highest transmission efficiency is always obtained.

Versatility and Adaptability — Because these roller chains operate on long or short centers, drive shafts clockwise or counterclockwise — separately or simultaneously, they simplify design problems, cut costs of complex drive mechanisms.

Quality — The acceptance of "Whitney" as a quality standard by designers of modern machines is the result of decades of chain making. Alloy steel parts are durably made — precisely assembled to stand up under the severest of operating conditions.

Whitney products are readily available through a nation-wide network of Whitney Distributors and Warehouses. Call the one nearest you for prompt service. For engineering assistance and catalogs write:



OTHER WHITNEY PRODUCTS

- Silent Chains — for smooth, high speed power transmission
- Conveyor Chains — for modern material handling
- Flexible Couplings — for positive but flexible direct drives
- Cut Tooth Sprockets — for smooth engagement, long life
- Whitney Woodruff Type Keys — for greater strength, easy assembly

WHITNEY CHAIN COMPANY

236 Hamilton Street, Hartford 2, Conn.

This CURLATOR INSTALLATION PAID FOR ITSELF in 6 MONTHS OPERATION

IN WOOD SAVINGS ALONE IN A NEWSPRINT MILL†

This is not a Paul Bunyan story. It has been accomplished and is being done today in actual mill operation. For example last year, by curlating pulp, one newsprint mill saved over 6,500 cords of pulpwood—more than enough to pay for several Curlators. In addition to this outstanding record more than enough sulphur, coal and limestone was saved to pay all this Curlator's operating and maintenance costs.

And while curlation was making possible this saving in pulpwood and increasing the yield, quality standards were absolutely maintained. It will pay any paper manufacturer to look into curlation and its possibilities. The many thousands of dollars that curlation saved in one mill can also be saved in many other newsprint mills.

†Name of mill furnished on request.

Why not find out what a Curlator can do for you?

MAIL THIS COUPON TODAY FOR DETAILS OF CURLATOR *Savings*

CURLATOR* *Corporation*

565 BLOSSOM ROAD · ROCHESTER 10, NEW YORK

*T.M. Reg.—
Curlator Corporation, Rochester, N. Y.

CURLATOR CORPORATION
Rochester 10, N. Y.

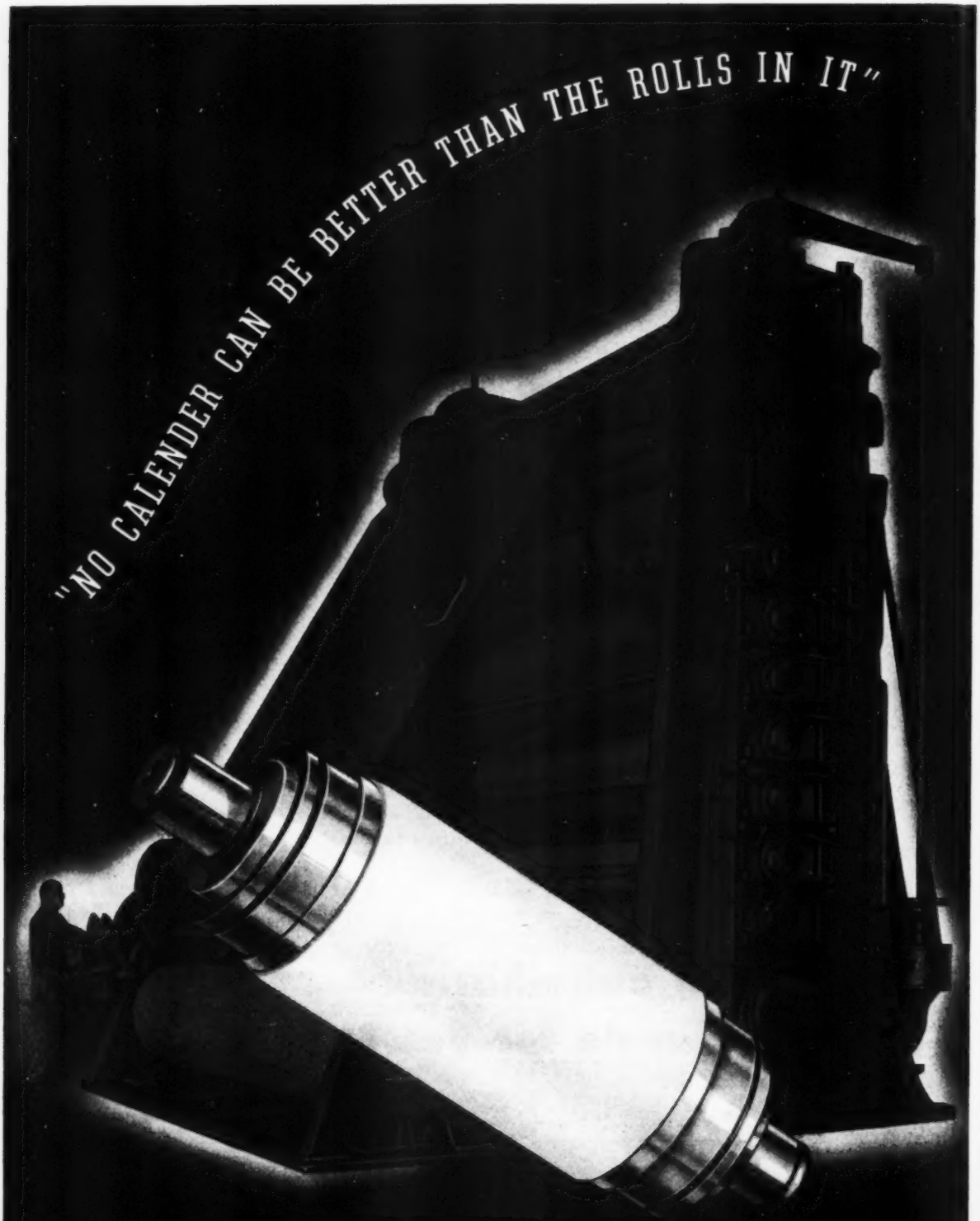
I would like to be shown what Curlator can do for me.

NAME_____

ADDRESS_____

CITY_____ STATE_____

"NO CALENDER CAN BE BETTER THAN THE ROLLS IN IT"

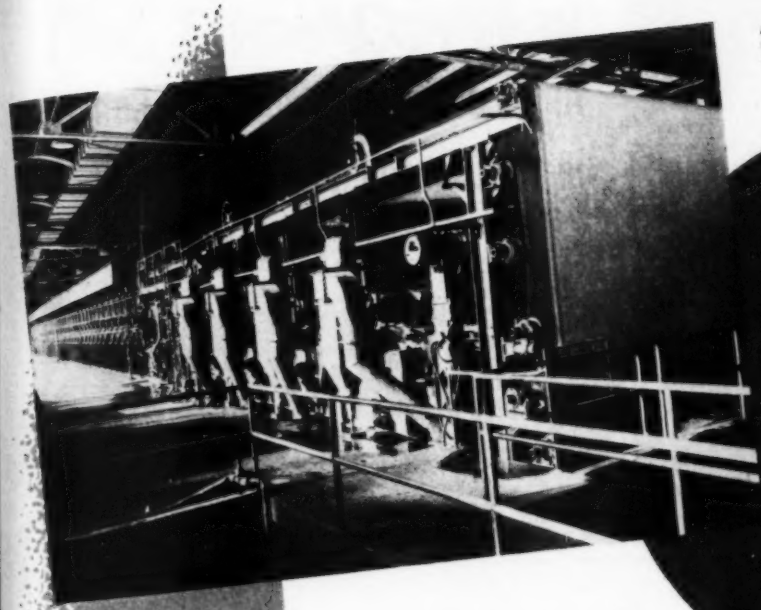


B. F. PERKINS & SON, Inc.

ENGINEERS AND MANUFACTURERS

HOLYOKE, MASS.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD



Alton's No. 3 machine, world's record strawboard producer. Photo courtesy of Alton Box Board Company, Alton, Illinois.

3-WAY SERVICE

at Alton Box Board Company

HERE are the three water treatment services performed by Nalco at Alton Box Board Company, Alton, Illinois. In addition, experimental work on process waters using Nalco anti-foam chemicals is now being done at Alton:

❶ SLIME CONTROL chemicals, fitted to Alton Box Board requirements, help maintain high quality . . . prevent slime spots and breaks due to slime.

❷ CLARIFICATION of mill water with Nalco #680 Sodium Aluminate . . . A versatile chemical also used widely for size control and maximum alum availability.

❸ BOILER WATER TREATMENT with specially-processed organic chemicals for use in high-capacity, high-pressure boilers.

Use of Nalco Chemicals and Services at Alton Box Board Company shows clearly the wide extent to which good water treatment, properly applied, can be utilized to make over-all mill operation cleaner, more efficient and more economical.

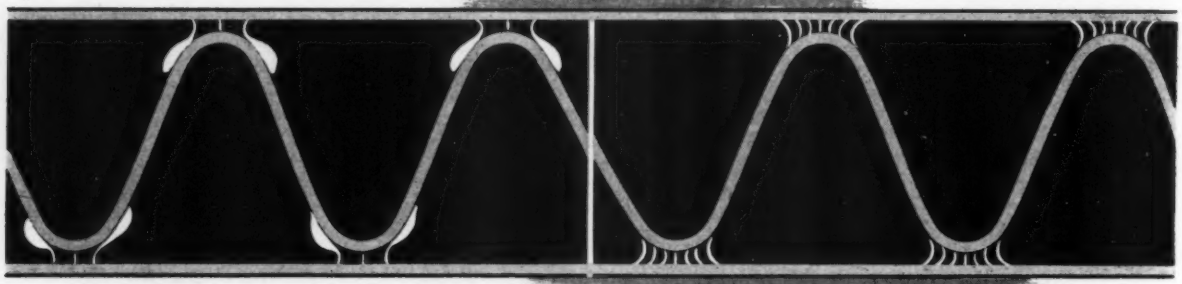
The Nalco System can be applied selectively, or for complete water treatment protection in *your* mill. Write today for full details on your specific water treatment problems.

NATIONAL ALUMINATE CORPORATION
6232 West 66th Place
Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario

THE *Nalco* SYSTEM • Serving the Paper Industry through Practical Applied Science

KELSIZE...

for Uniform Adhesive Application and Moisture Control in Corrugated Paperboard



NOT-this

UNCONTROLLED APPLICATION OF ADHESIVE

1. Excess adhesive.
2. Wasted adhesive serves no purpose.
3. More adhesive used . . . more moisture to remove.
4. Slower machine speeds.
5. Limp board.

this

CONTROLLED ADHESIVE APPLICATION WITH KELSIZE

1. Less waste . . . adhesive savings.
2. Adhesive where you want it . . . where it's needed.
3. Less adhesive used . . . less moisture to remove.
4. Higher machine speeds.
5. Reduced warping . . . stiffer board.

KELCO
REFINED ALGIN PRODUCTS

Only 15/100 of 1% of Kelsize in starch corrugated adhesive is required to give you these important advantages.

KELSIZE ...a product of KELCO COMPANY

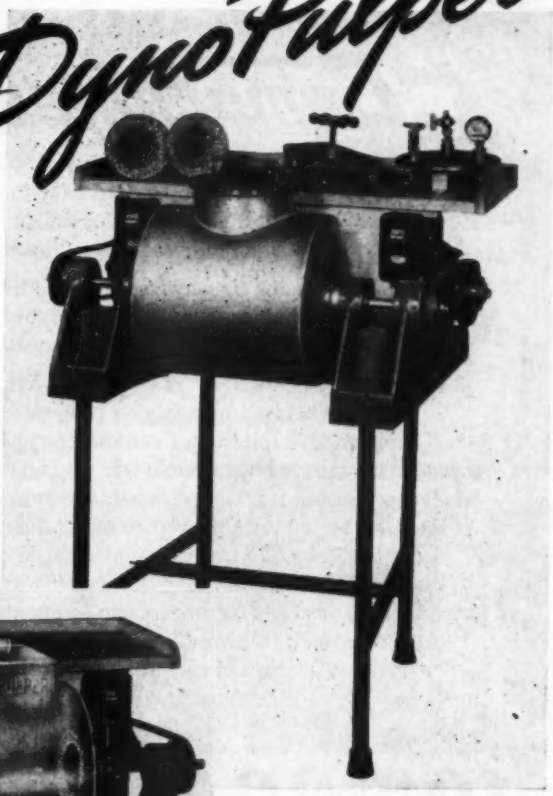
20 N. Wacker Drive
CHICAGO - 6

31 Nassau St.
NEW YORK - 5

530 W. Sixth St.
LOS ANGELES - 14

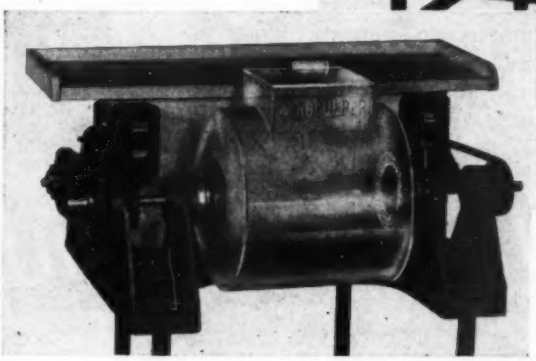
The Rice Barton

Laboratory DynoPulper



With it you can:

- ★ Evaluate Waste Paper and Pulp
- ★ Recognize Wet Strength
- ★ Determine Shrinkage in Waste Paper
- ★ Establish Dirt Count on Pulp
- ★ Match Colors (two minutes)
- ★ Test Mixtures of Stock



Model 3 SP Stainless Steel Laboratory DynoPulper. Can be used under pressure.

Model 3 Laboratory DynoPulper with Plexiglass Vat.

THE DynoPulper uses two opposed DynoPellers (described below) in a cylindrical horizontal vat. The revolving DynoPellers quickly disintegrate the stock and completely separate each fibre from its neighbor.

With the Laboratory DynoPulper you can perform many experiments at low cost. Results may be readily duplicated on production machines in mill operation.

DYNOMIZING the stock in the DynoPulper may be accomplished by several different methods depending on the kind of stock being processed. Cold water, hot water and steam pressure may be used separately or in various combinations to efficiently disintegrate every type of stock including wet strength papers . . . and with sparing use of chemicals.

Dynomized fibres are strong and free, and the original fibre length is maintained. The fibres are ideally prepared for de-inking.

Send for additional information

The DynoPeller
is the heart of all DynoMachines. Its concave face is lined with rough, hard carbide particles. As the DynoPeller rotates it causes a suction at its center that pulls the stock towards it. Centrifugal force then causes the stock to flow rapidly over the rough carbide particles. This effective dynomizing action completely disintegrates the stock . . . separating each fibre from its neighbor while maintaining its original length.

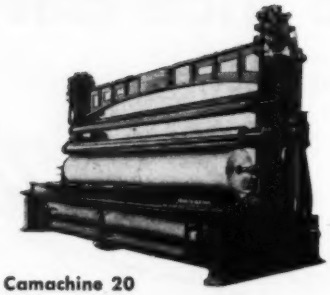
RICE BARTON *Research Corporation*
WORCESTER 1, MASS.

New Camachines®

of all types, installed in the first six months of 1950, added more than 105,000 feet per minute (web speed) to industry's potential roll production capacity.

Constantly expanding *Camachine* volume reflects the increasing need for top-quality roll products in the paper, printing, plastics, textile and rubber industries.

Wherever materials are produced or converted in roll form, *Camachines* may be depended upon to provide trouble-free slitting and winding at record-breaking roll production speeds. There's a reason for *Camachine's* unquestioned leadership... for 57 years Camachine engineers have specialized in the design and manufacture of faster, more dependable roll production equipment. *Camachines* raise the standards for roll quality, increase the pace of roll production, reduce the cost of the roll product.



Camachine 20

World's fastest paper mill winder, produces top-quality rolls at speeds up to 5000 f.p.m. on newsprint. Features air-operated slitters. Widths from 180″ to 300″. Rewound diameters to 40″ on paper, 60″ on board. Write for the descriptive bulletin "Mile-a-Minute."

105,000 feet per minute!*

*This figure is a composite of the web speeds of *Camachines* both *large and small* installed during the first half of 1950.

Cameron Machine Company • 61 Poplar Street • Brooklyn 2, N. Y.

Camachine engineers will be pleased to consult with you on any roll production problem.

All these Valves . . from One!

Valve combinations for 90% of industrial piping assembled with 4 bodies and a handful of parts.

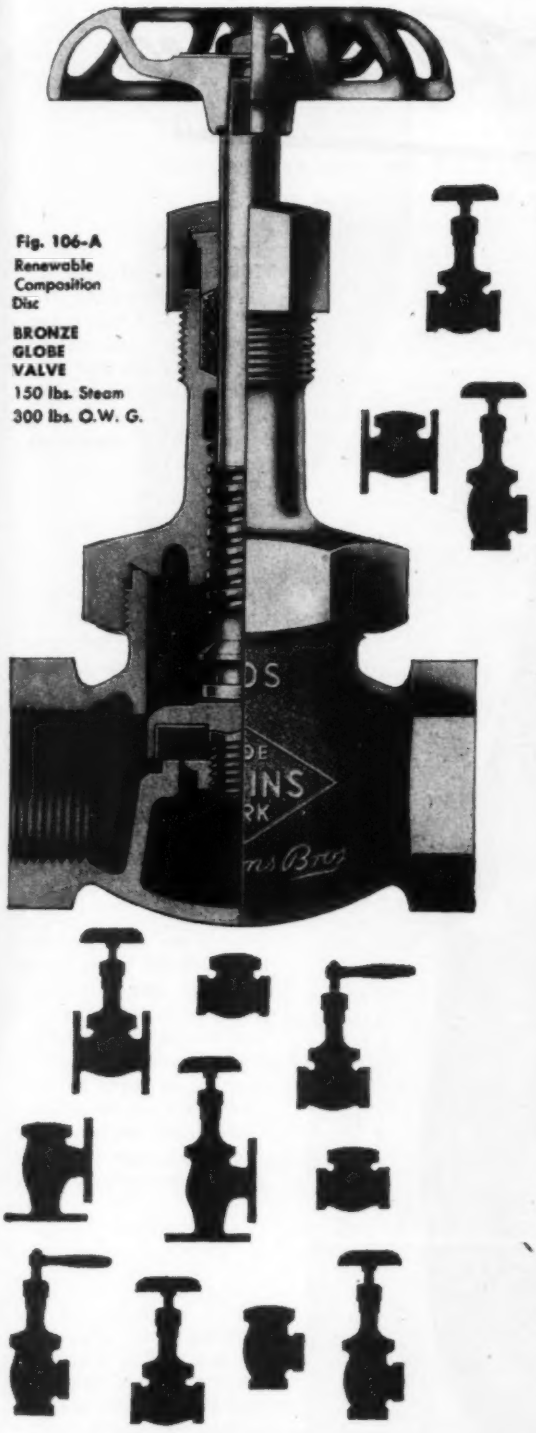
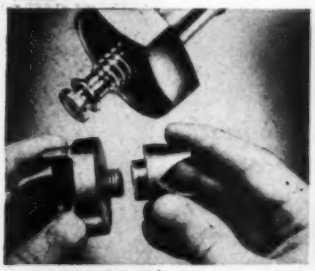


Fig. 106-A
Renewable Composition Disc

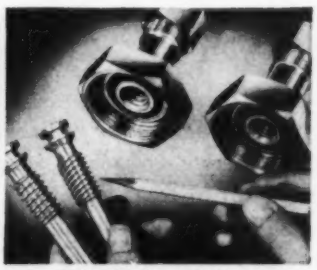
BRONZE GLOBE VALVE
150 lbs. Steam
300 lbs. O.W. G.

JENKINS FIG. 106-A "FAMILY"

Start with the standard Fig. 106-A. Trimming is interchangeable in Globe or Angle body, screwed or flanged.

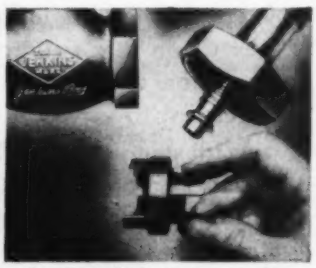


For Close Control — In throttling service, the nut which holds the disc in the disc holder is removed and replaced with Throttling Nut, Fig. 344.



For Quick Opening and Closing — Merely substitute the bonnet and spindle from Fig. 941, in which threads are pitched more sharply.

For Lift Check Service — Globe or Angle Bodies can be fitted with interchangeable Cap, Disc Holder, and Guide Disc Nut from Fig. 117A. Addition of spring from Fig. 655A provides spring loaded service.



For Stop & Check Service — Use the 106A trim, but substitute this spindle from Fig. 630A and replace the regular disc nut with the check valve guide disc nut.

Look over these pictures and see how easy it is to make up just the valve type you need, simply by interchanging parts. Think of the saving this means in maintenance expense . . . in reduced inventory of spare valves in your stockroom.

That's a big reason why the Fig. 106-A series takes top honors in any poll for valve preference. And Jenkins time-proved design, makes them the longest-lasting, lowest-upkeep valves that money can buy.

For example, see the heavy construction of the one-piece, screw-over bonnet. You can remove and replace it over and over again without distortion. See the extra size packing box,—and the perfectly machined threads on the heavy manganese bronze spindle, with more threads in contact with the bonnet, open or closed.

Remember, Jenkins Bros. is the originator of the renewable composition disc valve,—the *only* manufacturer of both valves *and* discs. For drop-tight, trouble-free performance, get acquainted with the Fig. 106-A "family". Despite their extra value, *you pay no more* for Jenkins Valves. Jenkins Bros., 100 Park Ave., New York 17, N. Y. Jenkins Bros., Ltd., Montreal. Sold through leading Industrial Distributors.

JENKINS
VALVES

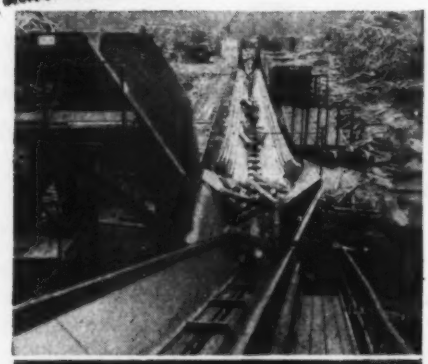
The Line of Most Resistance

REX Pulp Mill Chains

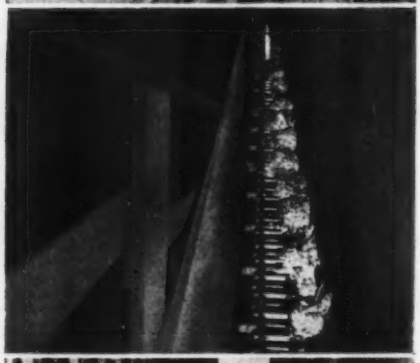
Maximum wear resistance and the *ultimate* in *shock resistance* are built-in features of all Rex Pulp Mill Chains. These quality chains are designed for dependability . . . for long-lasting service under every type of operating condition. Right through the mill, there's a Rex Chain that's right for every operation from log haul to the digesters.

With standard Rex Chains, you can forget about production hold-ups due to drive or conveyor failures. Rex Chains keep going under loads and operating conditions where ordinary chains would quickly fail.

For complete information and selection assistance, call your Rex Field Office or write direct to Chain Belt Company, 1714 West Bruce Street, Milwaukee 4, Wis., for your copy of Catalog 48-27.



This wood yard conveyor uses husky Rex Mill Refuse and Log Chains. Designed with alternating cast block links and steel side bar links, these chains provide a large sliding surface and maximum bearing area.



Rex H-Type Conveyor Chains are used in this refuse conveyor. Operating in shallow troughs, these chains with their great width assure large capacity at low speeds. Wide wearing shoes, reinforced barrel faces and vertical lugs on the side bars provide extra wear resistance.

One of the most popular chains in the wood room is husky Rex Combination. Inside block links of malleable iron or Rex Z-Metal and high carbon steel side bars assure plenty of wear-resistance. Chain links can be turned over when wear does take place, assuring double life.

Plenty of drive for the barking drum is assured by sturdy Rex Chabelco Steel Chain. Combining relatively light weight with high strength, it withstands the severe vibration and shocks . . . lasts longer.

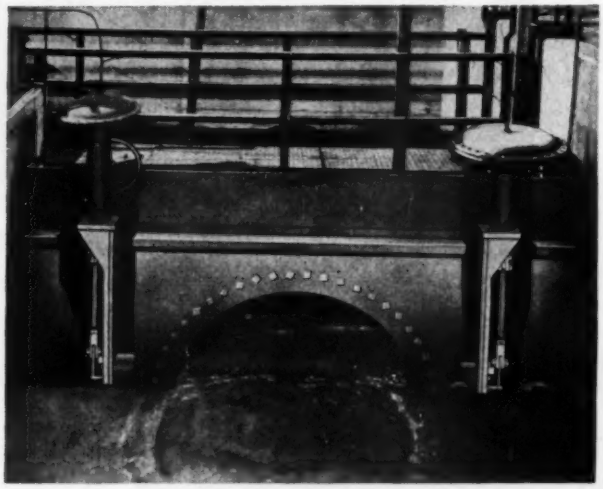
CHAIN BELT COMPANY — REX — DRIVE AND CONVEYOR CHAINS

FIRST FOR LASTING SERVICE

now available from stock

R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •



AUTOMATIC CONTROL of Industrial Sewage

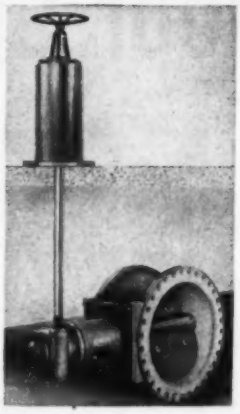
Photograph shows R-S 60-inch Valve discharging sewage from an oil refinery. The valve is operated by means of dual air diaphragm top works and stainless steel linkage, with a handwheel for emergency operation. By means of a level device, the valve is automatically closed at high tide thus eliminating the possibility of flooding the refinery. Valve opens automatically should the air pressure fail. Under emergency conditions or should all power fail, one man can close the valve with a few turns of the handwheel.

R-S Valves are used in air, gas, liquid, steam and semi-solid service in the pressure range from 2 to 2500 psig. They are available in sizes from 2-inches to 72-inches and larger for the simplified control and shut off of volume and pressure.

Consult with your local R-S Valve Engineers or write direct.

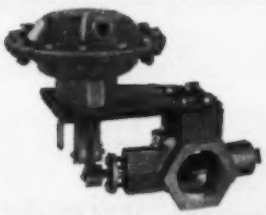
R-S PRODUCTS CORPORATION
4600 Germantown Avenue
Philadelphia 44, Pa.

No. 790—Eight-inch Steel Straight Through Slide Valve with pull lever control. Flange on left side when removed permits replacement of slide or cleaning of valve.



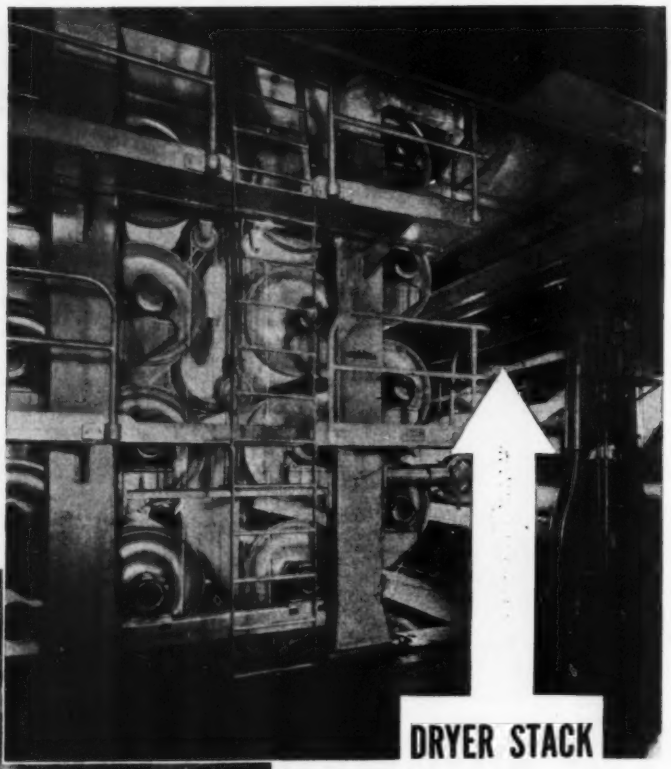
No. 788—Fifty-pound Heavy Duty Service Valve with rubber seat. Equipped with totally enclosed gear reduction drive, extended shaft and floor stand.

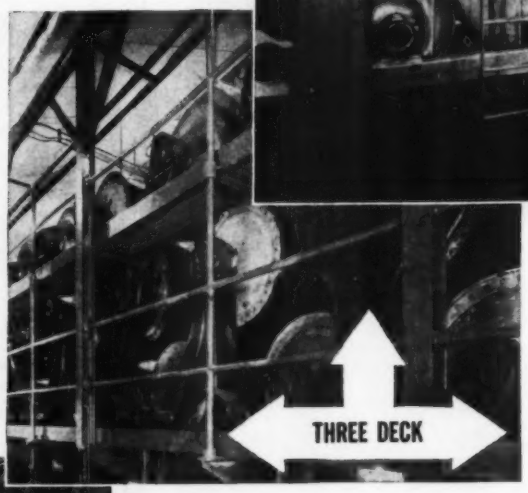
No. 769—Steel Off-center Relief Valve for low pressure drop. Hand lever can be used as an instrument lever. Counter weight on right side of valve. Relieves at 1 psi differential pressure.

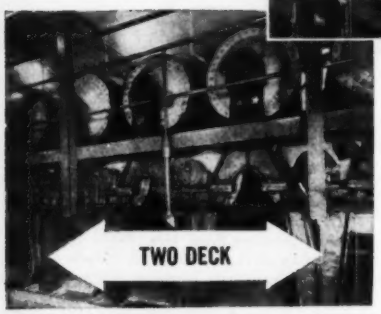


No. 778—Two-inch Threaded End Valve complete with bracket and diaphragm top.

DRYER Capacity *vs.* Floor Space







up

up

You would like to increase your production, but you think you haven't the space to add more dryers? Well, we have turned the trick in a number of mills where limited floor space seemed to be a discouraging factor.

Let our engineers know your problem, and you'll be surprised at what properly stacked additional dryers can do for you, with a minimum loss of accessibility. You'll get more production. And, your desired advantage will be long-lived if the dryers are Downingtowns with their uniform shell thickness and high, uniform heat transfer. These dryers are designed for steam pressures up to and including 150 lbs. per square inch.

Write us.

DOWNINGTOWN MANUFACTURING COMPANY

DOWNINGTOWN, PA.

Pacific Coast Representative: JOHN V. ROSLUND, Pacific Bldg., Portland 4, Ore.

DESIGNERS AND BUILDERS OF PAPER AND BOARD MAKING MACHINERY SINCE 1880

SCIENTIFIC CONSTRUCTION

Makes the Big Difference

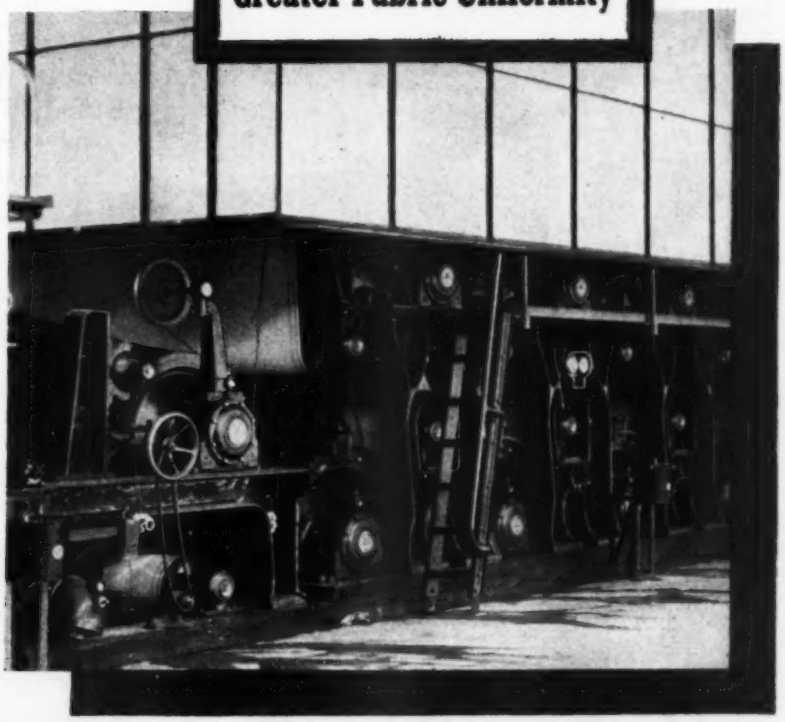
In DRYER FELTS

PATENTED

WOODBERRY 887 REINFORCED DRYER FELT

Gives You

Greater Fabric Uniformity



Asbestos yarns woven at scientifically determined intervals into the face of Woodberry 887 heavy duty dryer felts means longer wear, lower steam consumption, increased porosity, finer paper quality.

AT YOUR SERVICE

Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.

GAUGING FABRIC THICKNESS AFTER WEAVING. One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

TURNER HALSEY
COMPANY
Selling Agents
40 WORTH ST NEW YORK

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COULD YOU RUN FOR 4 DAYS

Without A Single Adjustment Of Your Stuff Valve?

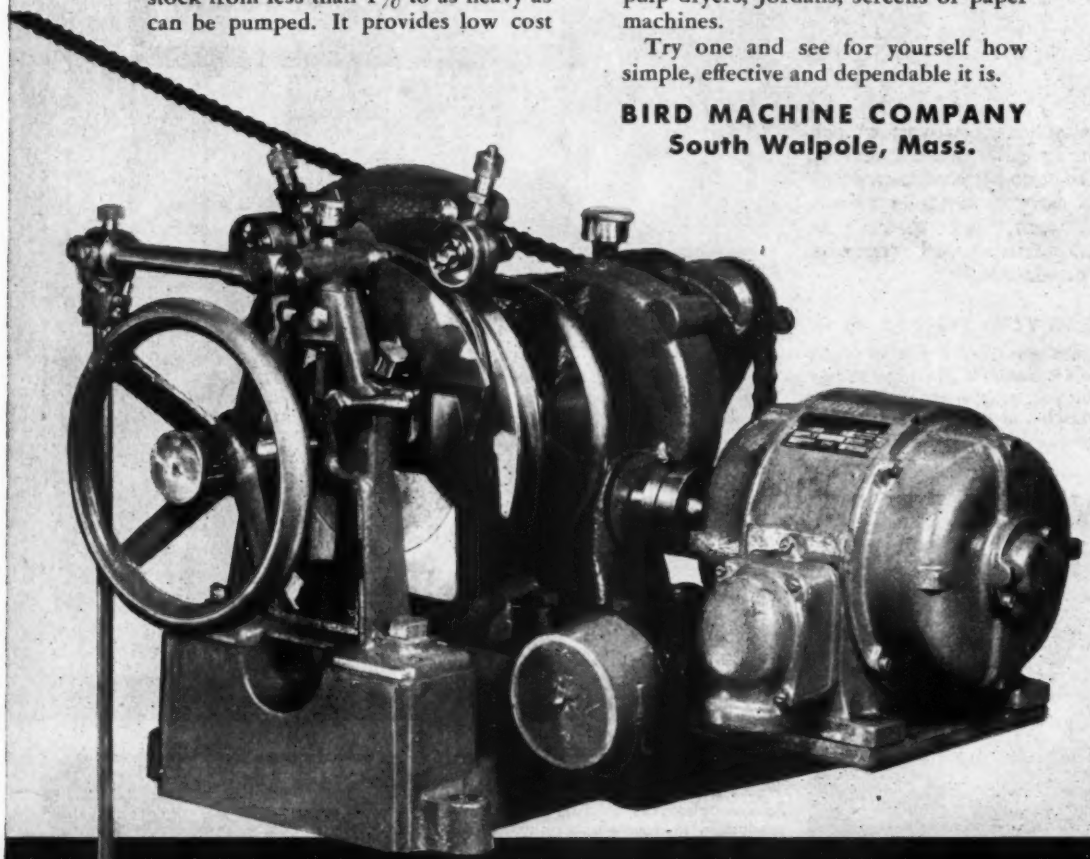
And Without Making A Single Pound Of Off Weight Paper?

That's what one user of the Bird Consistency Regulator did on his first trial run and now he wonders how he ever got along without it

The Bird Regulator holds consistency to not more than 0.1% heavier or lighter than desired. It works on any stock from less than 1% to as heavy as can be pumped. It provides low cost protection against overflow losses at pulp screens, variations in quality and production at knotters, bleachers, pulp dryers, Jordans, screens or paper machines.

Try one and see for yourself how simple, effective and dependable it is.

BIRD MACHINE COMPANY
South Walpole, Mass.



The BIRD CONSISTENCY REGULATOR

The Paper Industry

December 1950

Report on Stream Pollution Legislation

THREATENING ADDED COSTS for pulp and paper and other industries with waste disposal problems, is indicated by a survey of legislative developments reported from state capitals throughout the country.

Further progress under existing laws and interstate co-operation in attacking the problem also is being reported, with more stringent administrative policies looming in a number of states.

Colorado's 1951 legislature will be asked to consider a bill seeking a new and co-ordinated attack on stream pollution through creation of a nine-member council. The proposed legislation contemplates separate standards of pollution for Colorado streams depending on whether their main importance is for fishing or for removal of industrial waste.

A bill setting a "freeze" date beyond which there could be no new industrial pollution of Maryland's waters and streams without approval of the State Water Pollution Control Commission is expected to be introduced in the 1951 Maryland legislature.

Governor Scott is on record as favoring the enactment in North Carolina during 1951 of legislation aimed at curbing pollution of that state's streams. Terming the 1949 North Carolina legislature's rejection of such a bill a "mistake," Scott has asserted that anti-pollution legislation is needed to assure full development of the state's industrial and recreational resources.

Creation of a strong state agency to prevent pollution of municipal water supplies is expected to be proposed to the 1951 Texas legislature.

New Hampshire's 1951 legislature will receive a bill to enable the state to join the New England Interstate Water Pollution Control Commission in its interstate co-operative efforts to clean up the area's streams and other waters.

In Maine, the State Department of Health and Welfare is working on a pollution report it hopes to present to the 1951 state legislature. The department has been conducting a survey of coastal pollution, with the possibility that the move may lead to a complete and continuous survey of both inland and coastal water conditions in Maine. The pulp and paper industry surveyed Maine's major rivers in 1931, and a special survey was made of the Androscoggin River in 1941, but the forthcoming report will be the first to come entirely from a state agency.

A report by the Tennessee Stream Pollution Study Commission has recommended that the state become a member of the Ohio River Valley Water Sanitation Compact and that the state take the lead in organizing a Tennessee River Basin Compact. It also recommended reactivation of the Tennessee Stream Pollution Control Board, with strengthening changes.

In order to further intensify its anti-pollution campaign, the Wisconsin State Committee on Water Pollution asked for an appropriation of $216,000 for the next two years, compared with $166,000 for the current biennium.

Rhode Island voters at the recent general election authorized a $2,500,000 bond issue to advance the work of the Blackstone Valley Sewer District Commission, whose anti-pollution projects eventually will be self-liquidating.

The 1950 South Carolina legislature created a new State Water Pollution Control Authority which, operating under the State Board of Health, is charged with the task of reducing present pollution from sewage and industrial wastes and of regulating "the construction and operation of new disposal systems."

A measure enacted by the 1950 Kentucky legislature established a new seven-member State Water Pollution Control Commission, consolidating state anti-pollution activities which had been divided among three state agencies. The new Kentucky law requires plans for construction of disposal systems to be submitted to the commission for approval. It empowers the commission to take action against any person or company discharging anything into the waters of the state which contributes to pollution.

The anti-pollution legislative action of 1950, when comparatively few state legislatures convened, and the prospective more widespread action during 1951, when 44 legislatures will convene in regular session, marks an extension of a trend which in 1949 saw various types of anti-pollution legislation enacted in at least 14 states. This trend toward more stringent laws and intensified study of the problem is reflected in reports from many states of anti-pollution progress, although in all instances there is admittedly a long way to go before satisfactory conditions are reached.

In one example of progress under recently enacted legislation, New York State's Water Pollution Control Board, since its creation in 1949, has been laying the groundwork for a far-reaching anti-pollution campaign. Although the board has expressed belief that co-operation will succeed in solving the pollution problem, it has warned that where co-operative efforts fail, the stringent enforcement provisions of the new state law will be applied.

Encouraging anti-pollution progress is reported from Virginia. Since the creation in 1946 of the Virginia Water Control Board, a recent study showed, 23 sewage treatment plants were built in the state; another 23 plants were either planned, completed or under construction, and 29 more were under survey. It was further reported that since 1946, industrial waste entering Virginia streams has been reduced about half.

The world's fullest market basket naturally takes the shape of America. For that fact thank *industry* — steel mills and textile mills, paper mills and oil wells, machine tool plants and tractor plants, every place where wheels turn and men work. Wheels turn faster and men work more efficiently in *every* industry because of anti-friction bearings. And every industry knows and uses SKF Ball and Roller Bearings. Every industry knows SKF as pioneers. Every industry knows that SKF engineering anticipates their needs for exactly the right bearing to do the job at hand. **SKF** INDUSTRIES, INC., PHILADELPHIA 32, PA., *the Pioneers of the Deep-Groove Ball Bearing, Spherical Roller Bearing, Self-Aligning Ball Bearing.*

7031

HELPING MAP OUT *America's*
276-BILLION DOLLAR MARKET BASKET

The Paper Industry Current Comment

Election postlude . . . .

Political effects of election outcome not yet fully appraised . . . But anyone may estimate the future or the causes of the altered political complexion at Washington.

WITH ELECTIONS OVER, various announcements have been made as to future policies of the Administration and the extent to which the increased Republican minority may oppose an extension of the so-called Fair Deal.

The President has announced that no price or wage controls are immediately contemplated. It had been suspected that such controls were held in abeyance to prevent their impact on the voters, but now they are a less immediate prospect.

A drive is under way for the enactment of an Excess Profits Tax before the lame duck session of Congress ends.

There will be a re-examination of the Administration's foreign policy, whether or not the State Department favors such a procedure.

Unquestionably there will be less pressure for extreme controls on industry production.

Torquay duty rate reductions may be modified

The Reciprocal Trade Agreement program, of vital interest to the paper industry, faces certain restrictions. The effort to pass a measure to put the United States in the International Trade Organization by approval of the charter, is as good as dead. Duty rate reductions at the conferences in progress at Torquay probably will be modified, for the Administration realizes that radical cuts in duty rates will add to the opposition already existing against the manner in which the basic policy has been distorted.

Industry favors old M-241 over D.O. Regulations

While the need is recognized for some form of controls on industry in order to foster the defense effort, the paper industry is struggling for the institution of a form of voluntary controls by the cooperation of Government and industry which was successful in World War II. Government agencies are expected to call for about ten per cent of the paper and paperboard production for defense and allied national needs, but the industry is asking that such controls be exercised through a modified provision like the M-241 procedure of World War II, rather than through the arbitrary issuance of D.O. priorities of a mandatory type.

The pulp situation has already been officially recognized by the elimination of pulp from the functioning of D.O. ratings. Some D.O. priorities for paper, however, have been issued and are causing complications. Under this procedure an individual who secures a Government contract can secure a D.O. by which a paper company is required to supply the recipient of such a Government contract.

The type of procedure—not necessarily an actual instance—could be as follows: An enterprising agent could secure a contract to furnish the Government with a paper product which he had never before manufactured. He could then thumb through a paper trade directory, pick a manufacturer at random, and secure a D.O. for the supply of the required grade of paper and route that order to a company not conversant with the type of paper needed. The complications which might ensue can readily be appreciated.

A problem of specifications is also developing by which a Government agency figures a type of paper which it believes is required and orders such paper whether or not it is technically possible, or commercially practicable, to produce. This difficulty is due to the lack of experienced paper men in the various Government purchasing agencies. This situation is being rectified, but slowly, and meanwhile difficulties are pyramiding as between the Government buyers and the producers.

Meanwhile, consideration is being given to problems of paper manufacturers with reference to their own essential requirements. Some assurances have been given that means will be found to assure the mills of needed materials. For instance, there is a Government regulation restricting the use of copper. Bronze wires for fourdrinier machines might be involved if it were not for a ruling that such wires are essential for the production of paper, a vital necessity to national life. Similar steps are being taken to assure the mills of their requirements for sulphur, chlorine, and the like.

Based on the experience of the Government and industry alike in World War II, it seems likely that a saner approach will be attained than was possible in the earlier days of that period.

Peak operation essential—prospect dire if excess profits tax enacted

With the impact of defense purchases to a volume of an anticipated ten per cent of the output, prices of paper and paperboards have not risen unreasonably. High demand, however, is keeping the mills operating at an unprecedented rate, and deliveries are delayed by an average backlog of some eight weeks of orders ahead of the mills. The profitable operation resulting from a high operating ratio makes the problem of the proposed excess profits tax anything but pleasant.

The wastepaper problem is again acute with the heavy demand for packing material. Demand is heavy, and collection systems difficult to maintain in an industry where wastepaper is a feast or famine market.

So-called price fixing is in reality competition

Two ways of looking at the market for newsprint have become evident with increases scheduled for this grade after the first of the year. At one time, various United States and Canadian mills were quoting four different prices for 1951 delivery. Eventually the mills came to a practically uniform quotation of $106 per ton, with normal zone differentials. This unification of prices has led Congressman Celler, who conducted a news-

print investigation some months ago, to demand investigation by the Department of Justice of alleged price fixing. He claims that the uniform price is evidence of conspiracy. The other side of the picture is that the competitive nature of the industry forced those mills which had quoted higher prices than the present $106 base to cut their price to meet their competitors.

In other words, what Mr. Celler sees as price fixing is in fact a most precise evidence of the existence of true competition between rival manufacturers. If the final contract price had been at the higher figure of $110 quoted by some mills, there might be justification for a charge of price-fixing. When the final quotation is the lowest figure cited by any mill, the charge seems to be anything but well-founded.

An analysis of present production and consumer usage has led the principal economist of the paper industry to estimate that the mills have been facing an inflationary demand and that when scare buying eases paper will be in such abundant supply that, as he phrases it, "paper will be running out of our ears." An increase in production of 39 per cent above 1943 output justifies a careful look into the future by buyers and producers.

Financial

The securities markets, including paper mill stocks, have recovered from the weakness which followed the participation of Chinese troops in the Korean war and the uncertainty preceding the Congressional elections.

A.P.W. Products Co.—Net profit for nine months ended September 30 was $78,374 as compared with a deficit of $203,568 for the same period a year ago.

Certain-teed Products Corp.—Net income for nine months ended September 30 was $4,284,117 as compared with $3,354,919 for the same period in 1949.

Champion Paper & Fibre Corp.—Net income for three months ended September 30 was $2,598,837 as compared with $1,758,551 for the same quarter of 1949.

Continental Diamond Fibre Co.—Net income for nine months ended September 30 was $791,194 as compared with $349,411 for the same period in 1949.

Eastern Corp.—Net income for nine months ended September 30 was $1,007,344 as against a loss of $17,294 for the comparable period a year ago.

Gaylord Container Corp.—Net income for nine months ended September 30 was $3,757,680 as compared with $2,756,924 a year ago.

Hammermill Paper Co.—Net income for nine months ended September 30 was $1,870,081 as compared with $514,774 a year ago.

Hollingsworth & Whitney Co.—Net income for twelve months ended August 31 was $1,030,094 as compared with $1,000,187 for the previous fiscal year.

International Paper Co.—Net income for nine months ended September 30 was $49,431,585 as compared with $35,813,590 for the same period in 1949.

Lily-Tulip Cup Corp.—Net income for nine months ended September 30 was $2,507,883 as against $1,422,175 for the same period in 1949.

National Container Corp.—Net profit for nine months ended September 30 was $3,592,218 as compared with $1,773,205 a year ago.

Nekoosa-Edwards Paper Co.—Net income for nine months ended September 30 was $1,327,761 as compared with $693,802 for the same period in 1949.

Paraffine Cos., Inc.—Net income for three months ended September 30 was $1,041,155 as compared with a deficit of $507,700 for the same quarter in 1949.

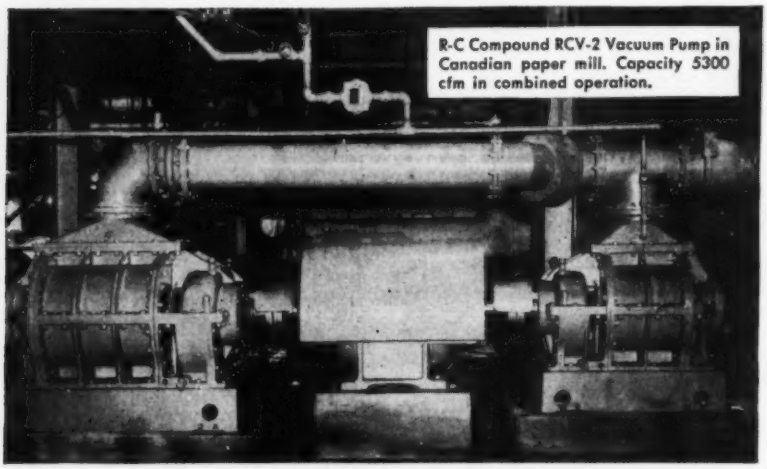
Puget Sound Pulp & Timber Co.—Net income for nine months ended September 30 was $1,686,464 as compared with $945,948 a year ago.

Rayonier, Inc.—Net income for nine months ended September 30 was $9,061,795 as against $4,108,819 for the same period a year ago.

Rhinelander Paper Co.—Net income for the year ended September 30 was $1,531,534 as compared with $952,535 for the previous fiscal year.

Riegel Paper Corp.—Net income for thirty-nine weeks ended October 3 was $1,332,735 as against $643,121 for the comparable period a year ago.

Robert Gair Co.—Net income for nine months ended September 30 was $4,004,947



R-C Compound RCV-2 Vacuum Pump in Canadian paper mill. Capacity 5300 cfm in combined operation.

HAVE YOU A VACUUM PUMP PROBLEM?

Then call on ROOTS-CONNERSVILLE for a wide line of standard sizes, built specially for paper mills.

For many years, Roots-Connersville has supplied cycloidal vacuum pumps for use on suction rolls, flat boxes and felt conditioners. Their long-time, excellent performance is the result of these important features:

High volumetric efficiencies—accurately maintained clearances, effectively sealed by water, insure high efficiencies; air being handled can be dry, or contain vapors or liquids.

Low friction losses—due to no contact between impellers or impellers and casings.

Higher speeds—permitting direct connection to standard motors, saving first cost, space and weight.

Flexibility—to meet varying vacuum requirements; suction automatically created to overcome resistance in system.

Durability and dependability—simplified design and construction for long-time, attention-free operation.

When planning replacements or new installations, consult Roots-Connersville for a permanent solution of your problems.

ROOTS-CONNERSVILLE BLOWER CORPORATION
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BLOWER BUILDERS SINCE 1854
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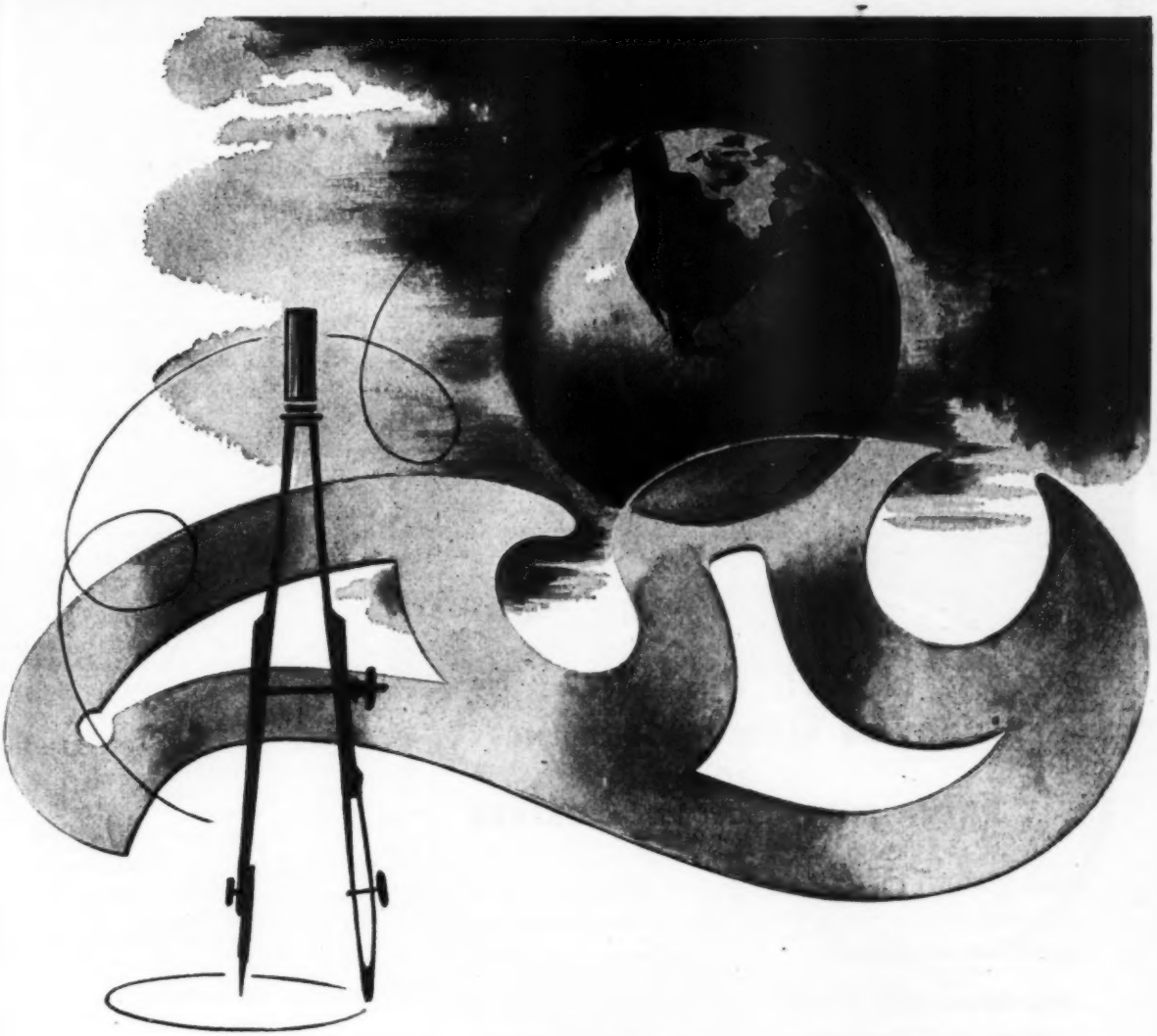

Our Rolling World

In today's world it takes seasoned experience and real "know-how" to forge ahead or even hold one's own.

It doesn't take too much experience to suggest that anti-friction bearings should replace sleeve bearings on a paper machine—or that more dryers would clear the way for higher machine speed. Those things are pretty obvious.

What wasn't so obvious was the deduction that the use of too much water was holding back the speed of the machine at a certain mill.

Yet, a Shartle man only recently cleared away that mill's production bottleneck by proper study of the water consumption—an analysis that cost the mill not a cent but meant many thousands of dollars saved on water usage and tonnage gained.

Black-Clawson, Shartle and Dilts engineers are qualified to make just such mill studies—are making them North, East, South and West almost every day in the year. Perhaps they could do you a good turn also.

Anything troubling you? If so, lay it in the B-C-S-D lap.

THE BLACK-CLAWSON CO., Hamilton, Ohio

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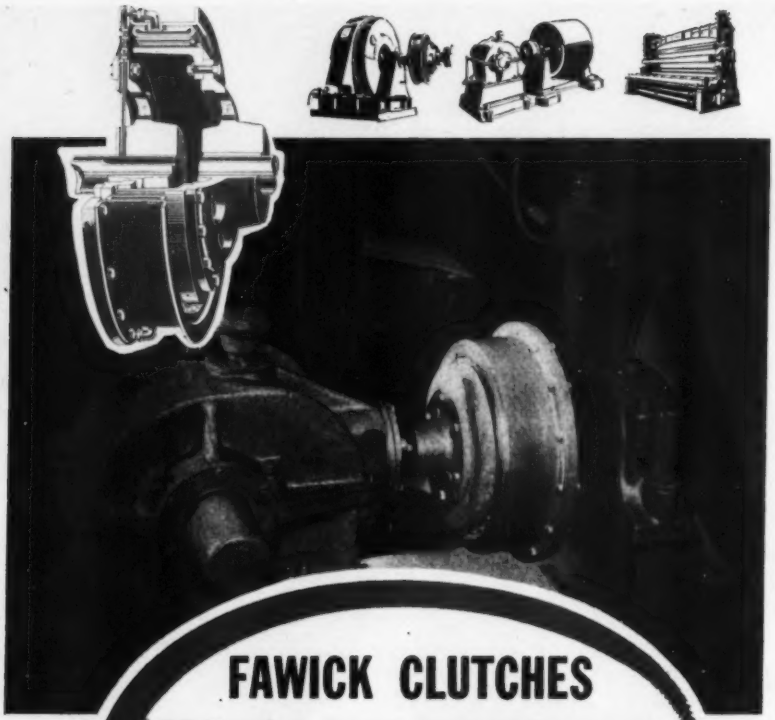


FAWICK CLUTCHES

PROVIDE PLUS PERFORMANCE on PAPER MILL SECTIONAL DRIVES

Fawick Airflex Clutches installed on calender or other sectional drives provide machines with outstanding operating advantages.

FULL OPERATING POWER is delivered by the 360° constant-velocity contact of the friction shoes with the drum.

SENSITIVE TORQUE CONTROL is obtained through the exclusive Fawick Clutch design and valving system.

LOAD SHOCK ABSORPTION is accomplished by the unrestricted flexible rubber tube.

These and many other Fawick features give users higher operating efficiency, greater safety, and better finished products.

For specific information on all advantages of Fawick Clutch and Brake units, write to the Main Office, Cleveland, Ohio, for Bulletin 300.

All desirable clutch characteristics are built into Fawick Airflex units

FAWICK CO., INC. Airflex

FAWICK CLUTCHES = + + + = PEAK EFFICIENCY

as compared with $2,980,922 for the same period a year ago.

St. Croix Paper Co.—Net income for nine months ended September 30 was $872,246 as compared with $854,465 a year ago.

Scott Paper Co.—Net income for nine months ended September 30 was $5,746,293 as compared with $3,859,337 a year ago.

Sutherland Paper Co.—Net income for nine months ended September 30 was $2,040,339 as compared with $1,293,335 a year ago.

Union Bag and Paper Corp.—Net income for nine months ended September 30 was $7,490,698 as compared with $4,934,789 a year ago.

United Wallpaper, Inc.—Net deficit for three months ended September 30 was $276,636 as compared with a deficit of $242,993 for the same quarter in 1949.

U.S. Gypsum Co.—Net income for nine months ended September 30 was $23,072,379 compared with $16,100,252 last year.

Paper Mill Corporate Changes

Eddy Paper Corp.—The Eddy company has purchased the International Paper Co. mill at Three Rivers, Mich., which it sold originally to International in 1930. During World War II the Eddy company leased the mill for emergency war work and will now have the repurchased plant remodeled and in operation with little delay.

Emperor Pulp & Paper Co.—This company, formerly known as the Marcellus Falls Paper Mills of Marcellus Falls, N.Y., has been purchased by the Industrial Container Corp. of Brooklyn and will be operated under the name Everett Paper Mills, Inc.

New York Stock Exchange—Stocks

(Closing Prices)

	Nov. 18	Oct. 21
A. P. W. Products	6	4⅞
Celotex	15	15¼
Same Preferred	16⅝	17
Certain-teed Products	14½	14⅜
Champion P. & F. Co.	44¾	45
Same Preferred	106⅛	105
Chesapeake Corp.	.....	41
Continental Diamond	11⅜	11
Container Corp.	60⅛	62¼
Same Preferred	*102½–104¾	104½
Crown Zellerbach	45	42⅞
Same Preferred	103⅜	103
Dixie Vortex	44½	46⅝
Same "A"	52	54½
Eastern Corp.	18⅞	18½
Robert Gair	10⅞	11
Same Preferred	18⅝	13⅞
Gaylord Container	23½	27
International Paper	48¼	46½
Same Preferred	105½	108
Kimberly-Clark	43⅞	43¼
McAndrews & Forbes	40	39½
Marathon	34	35
Masonite	60¼	57½
Mead Corp.	23⅝ (new)	30¼
Same Preferred	92⅝	92
Same 2nd Preferred	58	60
National Container	10¼	10⅜
Paraffine Cos.	17	16⅝
Same Preferred	98	98
Ravonier, Inc.	43½	44
Same Preferred	34¼	34¼
Scott Paper	44⅛	42½
Same $3.40 Preferred	90	99
Same $4.00 Preferred	106	106
St. Regis	10¼	11
Same Preferred	94⅛	95¼
Sutherland Paper	45	43¼
Same Preferred	115	114½
Union Bag & Paper Co.	38	36⅝
United Board & Carton	15	13½
United Wall Paper	2⅜	3
Same Preferred	* 22½–23	23½
U. S. Gypsum	115	111
Same Preferred	183¼	.....
West Va. P. & P. Co.	65⅛	68
Same Preferred	111	110½

New York Stock Exchange—Bonds

(Closing Prices)

	Nov. 18	Oct. 21
A. P. W. Products 3%	.....	83½
Celotex 3½%	.....	102½
Champion P. & F. Co. 3%	.....	104
Mead Corp. 3%	.....	106

New York Curb Exchange—Stocks

	Nov. 18	Oct. 21
Am. Writing	8	8
Great Northern	45¼	46

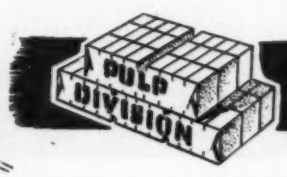
*Closing Bid and Asked Prices.

Developed by the Pulp Division, Weyerhaeuser Timber Company, hydraulic barking at first was used only to de-bark West Coast Hemlock in sulphite pulp making at a saving of as much as 20% in useable pulpwood.

Hydraulic barkers are now used also on sawlogs. By hydraulically de-barking sawlogs, not only is the efficiency of the sawmilling operations improved but bark-free sawmill slabs and edgings can be processed into clean sulphate pulp.

Such integrated sawmill and pulp operations provide for an interchange of material in such a manner that the by-product of one operation becomes the raw material for another.

In this way, Weyerhaeuser assures increased and continuing supplies of wood for the Pulp Division and its customers.



WEYERHAEUSER

Wire section of Rice Barton Corp. paper machine with stock preparation control board in background. The machine is designed for either crepe or flat papers; there is a six-roll calender stack

Press section control panel at start-up of paper machine. Herman A. Smith, of Rice Barton Corp., Hans Lenz, gen. mgr., and Don Alberto Lenz, president of Fabricas de Papel Loreto y Pena Porbre, and Edward T. Jones, Chas. T. Main, Inc., Boston

Newest Mexican mill starts operating

▶▶▶ THE FIRST PAPER at the new mill of Fabricas de Papel Loreto y Pena Pobre, San Angel, D. F. Mexico, was produced October 18. The paper machine start-up was unusually successful, the first reel of paper being completed in one hour and thirty-five minutes after stock was turned on.

The new plant, located adjacent to the present two-machine mill at Loreto, is a complete unit in itself. It consists of a 30-ton-per-day groundwood mill, a 120-inch trim paper machine, a converting plant, and a power plant. Special attention was given to the architectural details, both inside and out, resulting in a striking set of buildings in line with modern design in Mexico. The pulp and paper mill was designed to operate as a unit. A "U" shaped layout was used with the power plant in an independent building in between. There are no partitions between the paper mill units.

The power plant consists of two Combustion Engineering 50,000-pounds-per-hr., 425 psi, 750-deg. boilers. These are oil fired. There is one 1500 kw. condensing turbogenerator and one 1000 kw. 35-pound back pressure turbine. Power also is available from the transmission lines of the Mexican government. The steam and power distribution is all under ground. This plant also will service the existing two-machine mill at Loreto.

There are two Great Northern grinders driven by 1000 hp. motors. Groundwood is stored in a 10-ton chest at 5 per cent. A separate pumping system furnishes pulp for the old and new sections of the mill. This unit, which has been in operation for several months, is operated by two men, including wood han-

Load center with machine drive motor generator sets. All controls for entire mill are grouped in this air-conditioned room

Power plant showing Combustion Engineering Co. boilers; G-E turbine; control board; and 4150 v. switching

dling to the grinders. The stock preparation system is adjacent to the groundwood mill.

Both sulphite pulp, which is purchased, and kraft pulp from the company's Pena Pobre mill, are furnished to a Dilts Hydrapulper. A 6000-gal. water tank with automatic level control is used to assure consistency control. The baled pulp is loaded by lift trucks onto a floor level conveyor with a recording scale. One man is able to handle this operation. All chemical pump is handled in one 8-hour shift and stored in two 8-ton chests. Operation of all valves, pumps, and selection ot chests is handled from a single control board.

The refining and blending of the stock also is handled by a single operator. The chemical pulp is refined continuously and delivered to a refined chemical storage tank. A mixing chest is located near the paper machine and all controls for stock pumps, etc., including the weight and consistency regulator for the paper machine, are grouped at this location. From this platform, the entire operation of the groundwood mill and paper machine can be observed.

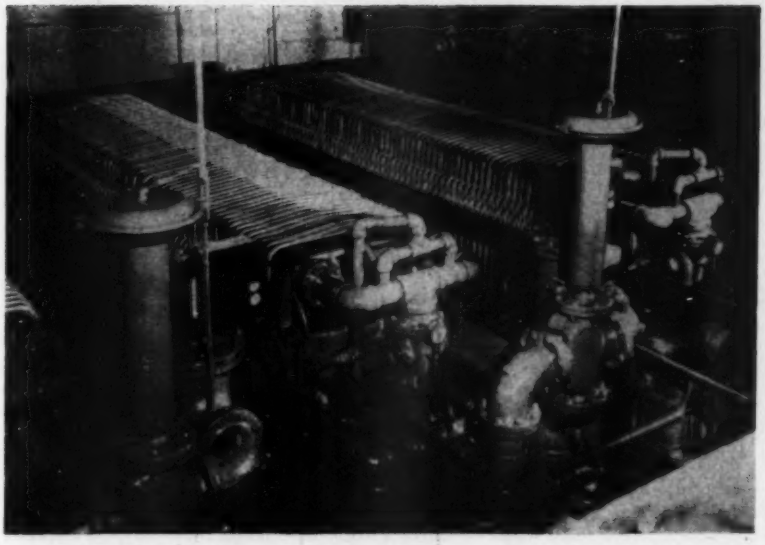
The paper machine was furnished by Rice Barton Corp. It is a 132-inch fourdrinier machine with a top pickup felt, creping dryer, crepe setting dryer, and fifteen 60-inch dryers. The machine has a General Electric sectional drive and is designed for either crepe or flat papers. There is a six-roll calender stack. The controls for the entire plant are located in a separate room with its own ventilating system, using filtered air.

The mill was designed by Chas. T. Main, Inc., of Boston. The construction of the buildings and installation of equipment was handled by the mill's own engineering force, using local contractors.

Rayonier Reorganized— New Officers Elected

In a reorganization completed recently, Charles R. Blyth, president of Blyth and Co., San Francisco, was elected chairman of the board of Rayonier Inc. W. G. Reed, president of Simpson Logging Co., Seattle, was elected chairman of the executive committee and executive vice president. Pending the selection of a president, Mr. Reed will be the chief operating executive and will establish his office in New York, where he will devote his entire time to Rayonier affairs.

Donald S. Leslie, executive vice president of Hammermill Paper Co. and J. D. Zellerbach, president of Crown Zellerbach Corp., were elected to fill two board vacancies. The necessary reorganization resulted from the resignation of Edward Bartsch and W. S. Lucey as officers and directors of Rayonier.



Operating view of Oco Water System Filters

Oco Water System Finishes Trial Period of Successful Operation

Last February, The Ohio Boxboard Co., at Rittman, Ohio, put into operation on two of its four board machines the Oco Water System. Results from this period of operation have been sufficiently encouraging to prove that the principles of the System are sound and to consider the extension of it to the other two machines.

The primary purpose of the development and of the installation was to reduce product costs, to conserve diminishing supplies of fresh water, and to recover heat and material wasted in the effluent water. These aims are being accomplished. A further effect which will produce far-reaching results in the paper industry in general is the substantial decrease and ultimate elimination of pollution caused by dumping such waste water into streams.

Among the factors contributing to reduction in costs are:

(a) shortening of investment write-off period

(b) increase in felt life

(c) reduction of power for pumping

(d) high clarity of the filtered water reducing the tinge factor

(e) raising the value of the paper produced because of its sharpened brightness

The Company reports that the heat saving factor about equals the cost of the filter aid, alum, filter papers, and chlorine used in the filters.

A portable laboratory setup has been developed by Oco Water Systems, Inc. which can be taken into any mill and an accurate test program has been worked out. The report and explanation of data so obtained shows what the Oco System will do in the mill tested, what the installation will cost, and what savings against this investment can be expected.

As of August 1, 1950, Oco Water Systems, Inc., formerly a wholly-owned subsidiary of The Ohio Boxboard Co., was sold to C. E. Carpenter, who retires as vice president of Ohio Boxboard on January 1, 1951. Mr. Carpenter has been president of Oco Water Systems since its organization and now becomes president and treasurer, and, with Mr. Lukemire, will operate the Company under the exclusive sales and license agreement with The Ohio Boxboard which owns all covering patent applications. Main office of the Company is Fort Miller, N. Y., just south of Glens Falls, where Mr. Carpenter has maintained residence for a number of years.

"Oco" filters are manufactured in the United States by two widely recognized machinery builders. For all installations east of the Mississippi River, equipment will be manufactured by The Sandy Hill Iron & Brass Works, Hudson Falls, N. Y., who also will handle export business except Canada, and who have exclusive sales rights in the eastern area except in the states of Ohio, Indiana, Kentucky, Tennessee, Michigan, Illinois, and Wisconsin, where sales rights are held by E. C. Jacobi, of Green Bay, Wis. The Valley Foundry and Machine Co., of Fresno, Calif., manufactures all Oco filters sold to pulp and paper mills west

of the Mississippi. Sales rights for the West coast are held by A. H. Lundberg, 308 Orpheum Building, 1900 Fifth Ave., Seattle, Wash., and his associate, C. L. Koerner, 7604 Southeast 17th Ave., Portland, Ore. Sales and manufacturing rights for Canada will be announced in the near future.

Two Kraft Paper Machines Ordered by St. Regis

Plans for early construction and installation of two kraft paper machines, as well as other pulp manufacturing facilities, have been announced by St. Regis Paper Co., New York. One machine will be added to the Pensacola, Fla., plant, and the other will be placed in operation at the firm's new mill at Jacksonville, Fla. Fully integrated with pulp manufactured from wood from the company's owned or leased woodlands, the $30,000,000 expansion program will add approximately 225,000 tons of kraft paper per year to the company's production. The new paper machines will supplement, rather than replace, facilities now in operation at Pensacola.

The new capacity will make paper available to replace multiwall bag paper now produced at the firm's northern New York mills from pulp imported from Canada and Scandinavian countries; substantial economic savings are anticipated through use of the company's own wood in an integrated operation. Northern New York mill production will not be curtailed, but those mills will henceforth concentrate upon production of speciality paper products made largely from bleached or unbleached kraft pulp.

A large part of the output of the new Southern capacity will be needed for the production of specification kraft paper for multiwall bags; another large percentage will be given over to bleached kraft paper and board for food containers.

Begin Work at Powell River

Contracts for more than $2,000,000 have been let by Powell River Co. for work on the wharf, sawmill and acid plant of the company mill situated about 60 miles from Vancouver, B.C., Canada, as part of a $11,000,000 major modernization program which will boost newsprint production some 40,000 tons per year.

Development on the mill, currently producing about 1000 tons of newsprint a day, will include installation of sectional unit drives to raise speeds of two paper machines from 1100 to 1475 fpm. The groundwood and screen room building will be expanded to make room for two new lines of pulp-grinding machines, and new chip storage bins will be installed. The electrical distributing system will be overhauled and a new steel tower high-tension transmission line will be set up from the Stillwater power plant 18 miles from the mill.

Hog fuel will be carried on a new conveyor, and additional hog fuel storage space will be provided. A new high pressure steam boiler with a capacity of about 230,000 pounds per hour will bring the total of boilers to eight; a new 10,000 kw. turbogenerator will make primary use of steam before it is passed on to productive use. Finally, a third unit of hydraulic barkers will be installed.

Florida Mills Draw Heavy Pulpwood Supply from State

More than a million cords of pulpwood were supplied to Florida's pulp and paper mills from the state's forests during 1949. The total volume, 1,036,118 standard cords, is reported in the business review of the Florida State Chamber of Commerce as 18 per cent over 1947 production and 15 per cent below the 1948 volume. Production of pulp through the Southeast showed the same trend, but Florida's 1947-1949 increase was greater than the gain in the whole region.

The greater part of the state's pulpwood production is pine, although 1734 cords of Florida hardwoods were also used by pulp mills last year.

Tree Farm Certificate Given to W. Va. P&P

One of the nation's largest tree farms was established near Charleston, S.C., on November 9 when members of the South Carolina Tree Farm Committee certified 340,000 acres of timberland located in nine counties and owned and operated by West Virginia Pulp and Paper Co. The timberlands were approved for membership in the National Tree Farm System after a study of the firm's timber management practices and inspection of its acreage by forest conservation officials.

The dedication ceremony was held in the heart of the company's woodlands, in Berkeley County, twenty miles north of Charleston. Senator Burnet R. Maybank made the principal address. Others appearing on the program were Charles H. Flory, state forester of the State Commission of Forestry, and Dr. D. W. Watkins, director of the South Carolina Extension Service, both members of the State Tree Farm Committee; R. E. Haynes, manager of the firm's Southern Woodlands Department; and James H. Graham, manager of the wood department of the company's Charleston mill. The Tree Farm certificate was presented by Mr. Flory to Theo. A. Cook, manager of the Charleston plant.

After the ceremony those participating were company guests at a barbecue served at the Harrington Plantation House.

Big Pulp and Paper Project—Mills on both Sides of St. Clair River

It is reported that a new company, the Premier Pulp and Paper Co., Ltd., will build a $7,000,000 groundwood and sulphite pulp mill in the Sarnia, Ont., area, on the Canadian side of the St. Clair River.

Further report is that the pulp mill is part of a $24,500,000 project which will include a $9,000,000 paper mill across the River at Port Huron, Mich. It is stated that facilities of both plants will permit doubling plant capacities.

The pulp, in slush form, would be pumped through a pipeline from the pulp mill to the Port Huron side, where it would be made into catalogue and directory paper. In this form, the pulp would cross the border duty free, whereas finished paper is subject to a tax of 15 to 20 per cent.

Sources of pulpwood supply would be an 1800 square mile area in northern Ontario. About 95 per cent of the wood would be transported to Sarnia by rail.

It is indicated by the announcement that the Premier Pulp and Paper Co. is a subsidiary of U.S. interests; that eastern capital is financing the project. Plans now call for construction to begin in March or April of next year. About 350 pepole will probably be employed in the Sarnia mill, and between 1500 and 2000 in woods operation.

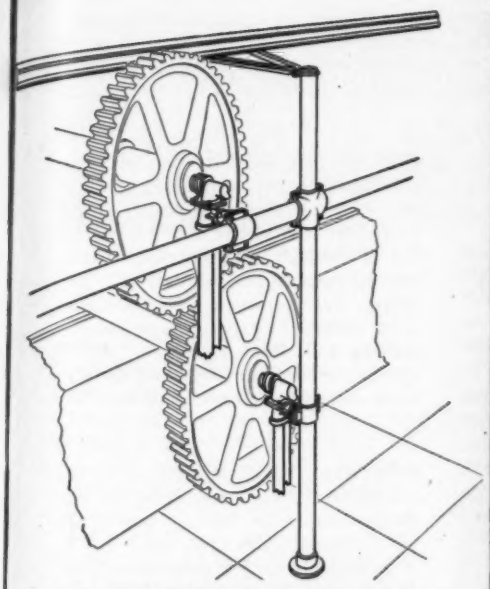
Paper Manufacturing Group Buys Interest in A.P.W.

A New York paper manufacturing group is purchasing approximately a one-third interest in A.P.W. Products Co. Inc., Albany, N.Y.

Roger W. Babson and Associates, Boston, are selling the stock to a group headed by Isadore Baum of New York, owner of several paper mills, in a conditional agreement in papers filed with Manufacturers Trust Co., New York, escrowee.

Study Course To Be Conducted by Upson Mgrs.

Eight divisional sales managers of The Upson Co., Lockport, N.Y., will conduct courses in the study and application of laminated wood fiber panels as part of the National Retail Lumber Dealers Association 30-day training courses. Begun three years ago by the Association as a public service to the building industry, the courses are participated in by lead-



The Puseyjones Improved Steam Joint on Dry Part having open-type gearing. This requires special outside pipe structure which serves to maintain exact alignment and minimum power consumption at all times. The flexible pipe connections incorporated in the steam and water piping compensate for any expansion or contraction in the supply headers and branch connections. In case of drop siphon, this may be adjusted to suit speed conditions by means of an extension as shown in end of steam joint.

New Life for Old Dry Parts

(A Case History)

In a prominent northern mill having six old machines, a rebuilding program was undertaken requiring an increase in speed and production. As additional power was limited, a trial installation of four Puseyjones Steam Joints and Siphons was made and results checked carefully.

So satisfactory were the economies obtained in power reduction and maintenance, combined with more efficient evacuation of condensate, that 64 additional units were installed to completely equip two machines.

This was later followed by an installation of 85 Puseyjones Steam Joints and Siphons to completely equip two more machines.

These four "old" machines are now operating at even higher speeds than were anticipated in the rebuilding program.

If you are interested in this subject, Puseyjones suggests a thorough study of the "Steam Joint Bulletin". Write for your copy today.

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery

Fabricators and Welders of All Classes of Steel and Alloy Products

Wilmington 99, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

ing building supply manufacturers to help dealer and jobber salesmen to a better understanding of problems and practices of the building trade.

Several leading universities co-operate with the Association in offering 30-day courses in a wide range of subjects including advertising, sales and legal problems, as well as technology of different building products. Some 570 salesmen-students in eight universities will be registered for the course conducted by Upson representatives.

Hubbs Corp. Announces Two New Divisions

The recently formed Hubbs Corp., New York, has been augmented by the addition of two new divisions, Hubbs & Corning Co., Baltimore, and Hubbs Paper Co., Rochester and Syracuse, N.Y.

Initially, Hubbs Corp. included unification of all facilities of Charles F. Hubbs Co. and Henry Lindenmeyr & Sons, both of New York. (Cf. P.I., Oct., 1950) The new members of Hubbs Corp. will conform to the corporation plan of maintaining their respective identities; they will continue to be managed and operated by their respective pre-unification staffs.

New Company Organized to Take Over Business of St. Raymond Paper

All shares and undertakings of St. Raymond Paper Co., Ltd., St. Raymond, Que., have been acquired by St. Raymond Properties Ltd., a new company recently incorporated for that purpose.

No public financing in connection with the change of ownership is contemplated at the present by the new owners of the 50 ton per day mill. Officers and directors of the new company include Jean Blais, president; Richard O. Johnson, vice president; Donald Taylor, secretary-treasurer; directors are Fred C. Anders, Russell D. Bell and Charles Donohue.

Marathon of Canada To Build Chlorine Plant

A recent press release indicates that Marathon Paper Mills of Canada, Ltd., will erect a 25 ton a day capacity chlorine plant at Marathon, Ont. Designer of the new plant is said to be Monsanto Chemical Co.

Reports indicate that the unit would be the first large chlorine plant in the United States or Canada to use De Nora mercury type cells with a rated capacity of 30,000 amperes; production would include rayon-grade caustic soda, chlorine, electrolytic sodium sulphide, sodium hypochlorite and synthetic hydrochloric acid.

Indications are that Monsanto in 1948 signed a tentative agreement with Dr. Aronzio De Nora, head of an Italian concern, for use and sale of De Nora mercury cells in this country.

Two Idle Mills Acquired by I. Lawrence Lesavoy

The purchase of two idle paper mills has been announced by I. Lawrence Lesavoy, who maintains offices in New York City and is president of both the Rayon Corp. of America and the Swedish Pulp Corp.

The mills purchased are the Paper Corp. of America plant at Cheboygan, Mich., and the Granville Paper Co., Newark, Ohio. In the announcement, Mr. Lesavoy stated that he had purchased the entire holdings of Murray Landy, stockholder and former secretary of Paper Corp. of America. The Cheboygan plant has been idle for about a year. This plant formerly manufactured writing papers, butcher's kraft and sulphite. It is expected that the plant will continue its regular line, but also will be equipped to turn out some newsprint.

The Granville paper mill also has been idle for a year and a half. The capacity of this plant is 100 tons per day. Newsprint also will be produced in this mill and ultimately the capacity may be increased to 300 tons per day.

Puget Sound Pulp and Timber Increases Facilities To Make Full Range of Pulp

A long range program undertaken by Puget Sound Pulp and Timber Co., Bellingham, Wash., designed to give the firm a full range of pulp is being concluded with the addition of facilities at the Bellingham mill to produce fully bleached pulp. At a cost of about $1,300,000, the bleached pulp equipment should be completed by next April.

As planned, the firm will then be able to offer a full range of pulp; unbleached, chemically bleached, semi-bleached and fully bleached pulp will be produced by Puget Sound. Currently, the firm is in an oversold position, and is working a three-shift day to deliver pulp to customers on an allocation basis.

PURCHASE OF SOYBEAN STRAW by the Ball Brothers Co. strawboard plant at Noblesville, Ind., is an innovation in papermaking, since few companies in the United States have as yet undertaken to manufacture paper from what is normally waste from the soybean crop. Since farmers have failed to meet this company's need for soybean straw at a time when there is a short crop of wheat straw, the Noblesville plant may be forced to curtail the manufacture of paper products.

AMONG THE FIRMS WHICH HAVE taken $1000 company memberships in the new Pulp and Paper Foundation at the University of Maine is Rust Engineering Co., Pittsburgh, Pa. The Foundation, first inaugurated last February (Cf. P.I., March, 1950), fosters a six-point program planned to step up the university's training and research programs and to attract and develop young men for ultimate management responsibilities.

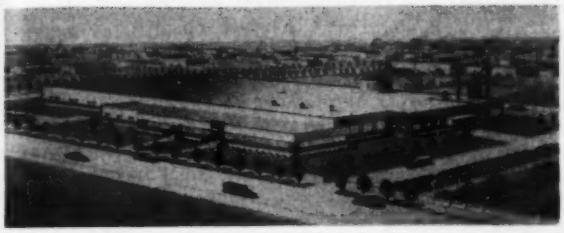
RETIREMENT PLAN BENEFITS of Crown Zellerbach Corp., San Francisco, employees who enter military service will be protected under provisions of an amendment to the firm's retirement plan. If approved by the Internal Revenue Department, employees who leave C-Z employment on or after June 26, 1950, will on their return to company employ be credited with benefits equal to those which would have accrued if they had remained on the job.

A PULPWOOD YARD HAS BEEN OPENED in Gurdon, Ark., by Lyman Masey. With "Witt" Childers as manager, the new yard will have a full-time scaler in operation. Material used in the new yard is green wood 5 feet in length with a minimum diameter of 4 inches, for which Mr. Masey is paying $12.00 a cord for pine and $9.00 a cord for gum, in any quantity.

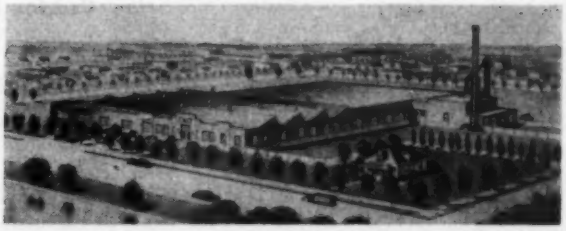
TREE FARMS IN THE UNITED STATES now number 2825, and cover 22,216,937 acres. Figures compiled by American Forest Products Industries, Inc., released last month, show that there are 77 more farms, with a total of 417,212 acres, listed on November 1 than were included on October 1. The South has 1601 of these farms, totaling 13,629,433 acres.

CUSTOMERS AND EMPLOYEES OF The Gardner Board and Carton Co., Middletown, Ohio, will henceforth travel in a Beechcraft D-18-S twin-engined airplane recently purchased by the company. The plane will also serve for emergency delivery of parts and equipment.

MILL MANAGERS OF the Printing, Publicating and Converting Paper Division of St. Regis Paper Co., New York, will henceforth report to E. R. Gay, vice president and director of the firm, who heads St. Regis' Kraft and Multiwall Bag Division.



New Philadelphia plant of Asten-Hill Mfg. Co. (Photographic print)



Recently enlarged Asten-Hill Ltd. plant at Valleyfield, Que. (print)

Asten-Hill Builds New U. S. Plant—Modernizes One in Canada

Enlargement has been completed at the Valleyfield, Que., Canada, plant of Asten-Hill Manufacturing Co., and the firm's new Philadelphia plant is now in operation.

Both plants were designed and constructed for the specific purpose of manufacturing asbestos dryer felts. Completed only a short time ago, the Philadelphia plant is one of the most modern industrial structures of its kind in the world. With the exception of the storage and shipping departments, the entire building is air conditioned. Efficient production from raw materials to finished felts is facilitated with careful design which provides that offices and manufacturing departments are all on one floor.

Although air conditioning eliminates the necessity for windows, they have been provided for the sake of exterior appearance and to guard against any feelings of claustrophobia on the part of employees. Humidity and temperature are closely controlled to protect employee health as well as to insure optimum manufacturing conditions. Quality control and employee comfort are likewise assisted by scientific fluorescent lighting throughout the plant. Color dynamics have been utilized in the interior to eliminate eyestrain and to reduce hazards. Collectors of the latest type have also been installed in those departments where a dust condition might otherwise exist.

Asten-Hill extends a cordial invitation to any paper mill friends who may be able to visit its new Philadelphia plant.

Papermakers are also welcome to visit the plant of Asten-Hill Ltd. at Valleyfield, Que., Canada, which was built in 1935 and has been enlarged and modernized along similar lines.

Bjorksten Research Expands—Three Added to Staff

Three men have been appointed to the staff of Bjorksten Research Laboratories, Inc., Madison, Wis., as part of the firm's expansion of the Chicago and Madison staffs.

In Madison, Kenneth L. Sayre, formerly associated with Standard Ultramarine Co., Huntington, W. Va., will carry on experimental and developmental work on electrochemical projects.

A 1950 graduate of the University of Wisconsin College of Engineering, Gordon W. Anderson, will work on mechanical aspects of chemical problems.

Edward G. Appel, formerly of the Girdler Corp. and its affiliate, Tube Turns, Inc., Louisville, Ky., will be engaged in the application of metallographic techniques in plastics research.

Orders for Two Paper Machines Given to Bagley & Sewall

Two large paper machines have been ordered from Bagley & Sewall Co., Watertown, N.Y. The company's president, Abe Cooper, has announced that receipt of the orders will require the employment of additional workers.

The St. Regis Paper Co. will place the larger of the two machines, a 228 inch wide fourdrinier designed to produce kraft paper for multiwall bags, in service at its Pensacola, Fla., mill; this machine is scheduled for delivery about next August.

In the latter part of 1951 Bagley & Sewall will deliver a 226 inch fourdrinier for newsprint paper production to Muztaler Holtoff und Paprier Fabriks Akt, Bruk, Austria.

Hooker Celebrates Opening of New Tacoma Plant

A reception for all Tacoma, Wash., plant employees of Hooker Electrochemical Co., Niagara Falls, N. Y., as well as a dinner for all members of the supervisory staff, recently celebrated the completion of new facilities at the plant for increased production of caustic soda and chlorine.

Expansion of production facilities consists primarily of installation of two circuits of the new Type S-3 electrolytic cells which have a far greater capacity than the old cells they have replaced. Additionally, extensive additions have been made for treating and handling brine, for purifying and evaporating caustic soda, and for liquifying chlorine. Triple effect pans have been installed for caustic evaporation and a new boiler now supplies additional steam needed. Other facilities completed in the expansion, first announced last spring, (Cf. P.I., Feb., 1950) include a new cell construction and renewal building, additional storage tanks, enlarged water supply system, expanded dock facilities, and other complementary equipment needed to handle increased equipment.

Ohio Injector Co. Sets Up Five Major Sales Divisions

So that sales services at the distributor and customer levels may be integrated, The Ohio Injector Co., Wadsworth, Ohio, has established five major sales divisions, each fuctioning under a field manager who is responsible to H. G. Smith, vice president in charge of sales.

The new sales divisions and their respective managers are:

New York Division (New York City, southern Connecticut and northern New Jersey)—Daniel J. Monney, Jr., New York.

Atlantic Division (Mobile, Ala., to Portland, Me., with exception of New York Division area)—Paul E. Warner, Philadelphia.

Central Division (Minneapolis to Buffalo, St. Louis to Pittsburgh)—W. G. Shepard, Wadsworth, Ohio.

Mid-Continent Division (Denver to Kansas City, El Paso to New Orleans)—A. A. Kruse, Jr., Dallas

Pacific Division (Los Angeles to Seattle)—Denny Gordon, San Francisco.

Blaw-Knox Will Do Piping For Expansion at Palatka, Fla., Plant of Hudson P & P

A contract has been awarded the Power Piping Division of Blaw-Knox Co. by Hudson Pulp & Paper Co. for piping requirements of an expansion project at the Hudson firm's Palatka, Fla., plant.

Additions at the Florida plant will

increase capacity for manufacture of cement bags and other waterproof paper products now in tight supply. The award to Blaw-Knox covers fabrication and erection of the complete piping systems for a new power plant and the additional process equipment, as well as for installation of paper mill equipment.

The new power plant consists of a power boiler, a recovery boiler and a 10,000 kv-a. turbine operated at 425 pounds pressure and 750 F.

Sales Conference Held by H. M. Harper Co.

Problems created by today's uncertain conditions were the subject of a recent sales conference attended by district office officials and factory representatives of H. M. Harper Co., Morton Grove, Ill.

Held at the Dairyman's Country Club, Boulder Junction, Wis., the conference featured addresses by H. M. Harper, company president, and various sales officials. The Harper Sales Achievement Award, given each year to the man making the greatest contribution to the Harper firm and its customers, was awarded this year to L. M. Hamlet, Milwaukee representative.

NEW EUROPEAN SALES representative for Edward Valve, Inc., East Chicago, Ind., is Societe Audco Belge S.A., Brussels, Belgium, a subsidiary of Audley Engineering Co., Ltd., Newport, Shropshire, England. Audley is licensed to build and market Nordstrom lubricated plug valves in Britain and the Continent; Nordstrom, which has Pittsburgh headquarters, is a division of Rockwell Manufacturing Co., Pittsburgh, as Edward Valves is a subsidiary.

REMOVAL OF CHICAGO OFFICES of Pennsylvania Salt Manufacturing Co., Philadelphia, from 20 North Wacker Drive to 228 North LaSalle St. has been completed. The new office is under the direction of George D. Grogan, district sales manager of the Heavy Chemicals Department, and John C. Hampson, district sales manager of the Special Chemicals Department.

NOW THE EXCLUSIVE PACIFIC Coast representative of Chemical Linings, Inc., Watertown, N.Y., S. A. Salmonson has terminated his connection with Chemipulp Process, Inc. From offices at 1220 S. W. Morrison St., Portland 5, Ore., Mr. Salmonson will be in charge of the Pacific Coast sales and service organization of Chemical Linings and its two affiliates, Homad Services Ltd. and Nukem Products Corp.

New Use for Para-Cymene

Para-cymene has been successfully converted into para-cresol, important in the manufacture of dyes and disinfectants. The Hercules Powder Co. has in pilot plant stage a process for converting cymene by peroxidation into methylcumene hydroperoxide. which can then be split into aceton and cresol. (This announcement occurs in *Chem. Eng. News,* Oct. 23, 1950)

The production of para-cresol offers a possible new use for sulphite turpentine, which is largely para-cymene, and which is always formed in small amounts [Cf. T. T. Collins, Jr., *The Paper Industry and Paper World* 27, 537-40 and 719-22 (1945)], whenever a coniferous wood is pulped by the sulphite process.

Charles Bruning Co., Inc., Plans New Plant at Teterboro, N.J.

Plans for the construction of a $1,000,000 plant at Teterboro, N.J., have been announced by Charles Bruning Co., Inc., New York. Expected to be in operation within a year, the plant will be erected on a ten acre plot of land.

When the one story, brick and steel plant is completed, Eastern manufacturing of the company will be centralized at the new location, and the research department and executive headquarters will also be transferred. Executives of the firm will make their offices in a two story annex to the building which will also accommodate the laboratory.

Behr-Manning Building New Plant for Waterproof Sandpaper Div.

A new building will be erected at Watervliet, N.Y., by Behr-Manning Corp., a division of Norton Co., Troy, N.Y., to house the firm's waterproof sandpaper division.

Part of an over-all construction program undertaken by Behr-Manning, the waterproof sandpaper division will now have 60,000 square feet of space and will be built adjacent to present plant buildings. Since 1940 the firm's expansion program has doubled the size of the plant; ten new buildings, including the new office quarters, have been completed.

ACQUISITION OF V-Mac Industries, Inc., Guilford, Conn., by Capewell Manufacturing Co., Hartford, Conn., has materially extended the purchaser's line of products. All employees, machinery and production facilities of V-Mac have been transferred to Hartford for continued production of pipe threading, cutting and reaming tools.

A NEW SALES OFFICE has been opened by Pennsylvania Salt Manufacturing Co., Cleveland, at 2168 Shattuck Ave., Berkeley, Cal. R. A. Snyder, who will do technical sales service work for metal and maintenance cleaners in California industries, will make the new office his headquarters as will J. Cameron Siddall, who will handle technical sales and service for agriculture in California, Arizona and New Mexico.

Delou, Inc., Importer Gums and Resins Now Has Offices in New York City

National offices have been established by Delou, Inc., at 90 West St., New York 6, N.Y., for the exclusive importation into the United States of a complete line of natural gums and resins, including shellac for incorporation into paper products.

The Delou firm is the exclusive sales agent for specially dewaxed gum damar, one of the better resins for the manufacture of nitrocellulose lacquers. Although many items in gum and resin fields are in short supply today, the Delou company is able to give immediate delivery on any material it manufactures.

INSULATING MATERIALS MANUFACTURED by General Electric Co's Chemical Department may now be obtained in Maine and New Hampshire through Stultz Electric Works, 817 Main St., Westbrook, Maine, recently appointed distributor of G-E insulation materials. In addition to maintaining complete repair facilities, the Stultz firm will sell G-E insulating materials to those companies which maintain their own repair shops.

MANUFACTURE AND SALE of Jarecki Valves formerly produced at the Jarecki Manufacturing Co. plant at Erie, Pa., will now be manufactured in H. K. Porter Co.'s Hinderliter Tool Co. Division plant at Tulsa, Okla. The Porter firm has formed a new Division, Jarecki Valve Division, for production of the new line of iron and bronze valves and cocks.

MEN WHO USE PRINTING INK were the guests of men who make it when George H. Morrill Co., Division of Sun Chemical Corp., formally opened a new plant at Ft. Worth, Tex. Sid Rochelle, Morrill's Ft. Worth district manager, and Fred Baker, factory manager, conducted an inspection tour of the plant. Visitors saw machinery in operation and inspected processes by which the Morrill firm makes news black ink and commercial color inks.

The Paper Industry Pictured Highlights

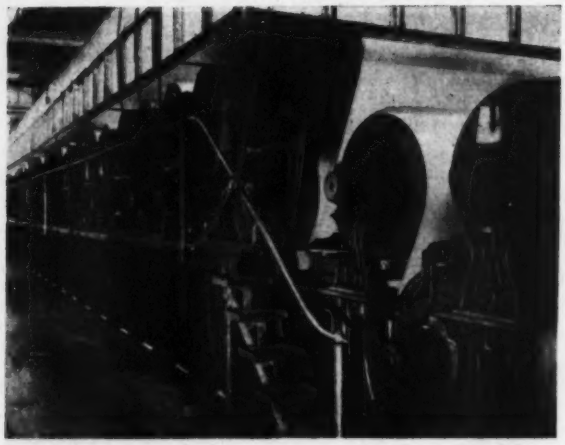
GIFT OF SILVER DOLLARS—fifty of them—is golden jubilee present from son, Edward T. Gardner, Jr., to his father. . . . Edward T., Sr., is a co-founder and president of The Gardner Board and Carton Co., Middletown, Ohio, which is this year celebrating its fiftieth anniversary.

OLD WORLD CHARM combined with the most modern facilities in this fine building recently acquired by Frank W. Egan & Co., Bound Brook, N. J. Here the company will house its expanded design and drafting departments, as well as a laboratory for demonstration of various converting and drying equipment. Egan Co. manufactures machinery for the paper converting and plastics industries.

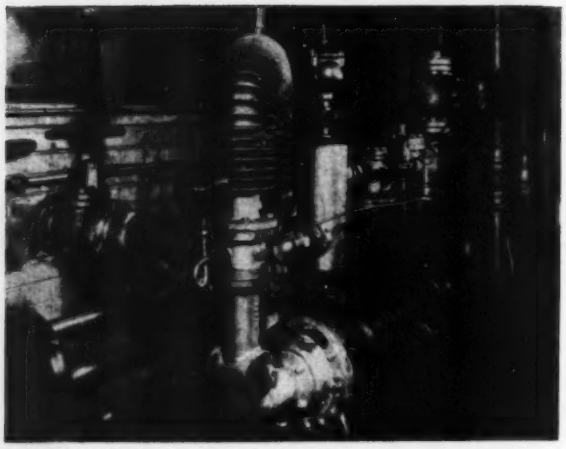
THE PRINTED WORD must be regarded as a real weapon against Communism, according to George S. Dively, pres. of Harris-Seybold Co. His company has offered a Harris offset press to the National Committee for a free Europe.

WORLD'S LARGEST PONDEROSA PINE has been felled by Blagen Lumber Co., White Pines, Calif. Shown are two of the 13 logs felled from the 350-year-old giant that was 229 ft. high and 100 inches diam. at breast height. (AFPI photo—courtesy Blagen Lumber Co.)

VISITING A PAPER MILL is typical of what happens on a B-E Day. Local school teachers tour Fitchburg Paper Co., Fitchburg, Mass., on Business-Education Day. These days give teachers a "look-in" on industry and national economy.



Board is dried on the 81 dryers now equipped with a C-B condensate return system



Cochrane high capacity, high differential condensate drainage control unit returns condensate from dryers to boiler

New equipment improves operations at Philadelphia board mill

Installation of a new condensate return system increases production . . . improves quality . . . and permits fuel savings

ROBERT S. BROOKOVER
Superintendent
Crown Paper Board Co., Inc.
(Philadelphia)

▸▸▸ IN PAPER MACHINE drying, it is desirable to obtain the most efficient heat transfer to the paper that is possible from the pressure of the steam utilized. At Crown Paper Board Co., Inc., we have a seven-cylinder machine consisting of 81 dryers, 36-inch diameter by 78 inches long (73 inch widest trim).

While this is an old machine, it always has been well maintained and we are more than satisfied with our latest modification consisting of a new condensate drainage control system now in operation nearly two years that has resulted in an impressive increase in production with an estimated fuel saving in excess of $10,000 annually.

Heat Balance

Originally, condensate from the 81 dryers was trapped with five tilting traps dumping into an open hot well from which a transfer pump put it, along with zeolite treated makeup, through the vent condenser into the deaerating feedwater heater. The five condensate lines now have been manifolded ahead of the tilt traps which have been eliminated. Condensate flows to the suction of a 25-hp. Cochrane C-B condensate drainage control unit through a small heat exchanger (16½ sq. ft.) to condense excess blow-through steam thus insuring continuous consistent condensate. flow. The C-B inlet is about 3 ft. below the bottom of the paper machine dryers.

Entrained air and non-condensable gases are removed from the dryers and are eliminated to atmosphere on the discharge side of the unit through an air separating chamber that reduces the velocity of flow from which the gases are automatically trapped from the condensate return line. The condensate is automatically discharged to the single 160 psi boiler at the rate at which it is formed downstream from the feedwater makeup regulator which controls makeup only.

Production Increase

Because of the maintenance of high back pressure on the condensate header, there is less pressure drop and consequent loss in temperature head through the dryer. This results in a higher more intense heat transfer rate through the dryer surface to the paper. For example, if rolls are partially filled with condensate or non-condensable gases the part of the surface with which steam was in contact would be hotter than the part with which the condensate was in contact. As the sheet passed over these rolls it would be intermittently heated to a higher and lesser degree thus tending to cause cockling and wet spots. If some rolls are hotter than others this same difficulty also exists.

Wet spots or ununiform moisture content of the paper causes weaknesses where the drying is not complete and requires that the operator slow the machine down resulting in lost production, tearing of the sheet, and other operating difficulties. This is ordinarily due largely to improper drainage of condensate and entrained gases and air from the dryers. The dryer surface temperatures obtained show consistently high surface temperatures from the wet end to the dry end of the machine within 7 deg. to 10 deg. of the steam space temperature under full condensing load.

The uniformity of surface temperature and the closeness to which it can approach the temperature of the pressure of the steam utilized under condensing load assists the operator in maintaining maximum speed in production and better quality of product.

Fuel Saving

With the condensate going directly to the boiler at steam temperature, there is at least 88 deg. more temperature equivalent to more than 8 percent fuel saving on that portion of the fuel used to generate steam for the paper machine dryers.

By another calculation, an 88 deg. increase in 32,500 lb. of condensate per

hour is about 2,860,000 Btu per hour. This saves 20 gal. of 140,000 Btu oil per hour—at 6c, $1.20 an hour, $28.80 a day, over $200.00 a week, and over $10,000 a year in fuel saving alone.

In addition, there is a very real saving in the recovering of water previously lost from the hot well by flashing and the cost of feedwater treatment for this additional makeup water that was previously required.

Condensate System

Ordinary feed pumps are not capable of handling the mixture of entrained non-condensable gases and condensate at high temperature as they come from the paper machine dryers. The condensate at close to vaporization temperature tends to flash at the pump suction and bind the pump.

In the Cochrane C-B system a specially designed centrifugal pump draws water from the thermo-fin priming loop and discharges it as a high velocity jet through the jet pump nozzle. This jet strikes the returning hot condensate and induces condensate flow through the Venturi-shaped mixing tube and into the thermo-fin priming loop. The additional volume of condensate introduced into the constantly filled loop results in the discharge of an equal volume of condensate through the air separator to the boiler.

The hot condensate and entrained air are drawn rapidly and positively from the paper machine dryers by the jet pump. Air is eliminated from the circuit, as described previously, by passing through the air separator and the condensate is returned at maximum temperature and pressure directly to the boiler. Thus the circuit is completed in a closed circuit from the boiler through the turbine exhausting to the paper machine dryers and back to the boiler without substantial loss of temperature. Performance of the unit is verified by the pressure gauges on the inlet and discharges sides plus the thermometer in the loop.

Summary

The principal advantages of the Cochrane C-B condensate drainage control system are the possibility of maintaining high and uniform steam surface temperatures on the individual dryers of the entire machine resulting in increased board production of improved quality plus the fuel saving possible from the continuous return of condensate directly to the boiler at high temperature and high pressure. In our particular case, while annual dollar savings are important, (paying for the entire installation in less than six months) the increased production potential from maintenance of optimum drying conditions on the paper machine is even more profitable.

How to set up a maintenance stores department

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▶▶▶ THE PROBLEM OF providing adequate maintenance stores in a paper mill does not differ in theory from the same problem in other types of manufacturing plants. The objective is to have on hand materials and spare parts when required, while at the same time achieving an economic balance in the dollar investment.

Problems special to the paper industry

Many of the larger paper mills are located in rural or remote areas in order to be close to pulpwood supplies, hydro-power, and process water. In many cases, this places the mill outside of areas where quick delivery can be secured on replacement parts, even on such standard items as miscellaneous hardware, pipe fittings, machine bolts, and other expendable items. The paper manufacturer so located must have provisions to manufacture many of these items in his own shop, or he must take into account the elongated delivery times in establishing his stock levels. Capital investment in papermaking machinery is high, and these machines are normally scheduled 24 hours a day, six days a week. Therefore, the maintenance superintendent must go long on certain expensive replacement parts so that production delays may be minimized if there are serious breakdowns.

Due to the inaccessibility of some of the mills, the maintenance forces usually carry out a large part of the construction projects which are normally subcontracted by mills. Maintenance stores are called upon to supply these construction projects, as well as the materials and supplies used only in maintenance.

What to stock

In an established mill, determining what to stock is best accomplished by a review and analysis of past stores records. If these records do not exist, the purchase orders should be reviewed and summarized by item so that some estimate of past usage can be determined. This may be done by taking off all of the items which are in stock, or which have been purchased over the past year, as a starting point. Any item which has not been used for a period of twelve months, or which is not an important spare part, generally should not be stocked. If the items on hand do not fall in either of these categories, they should be disposed of and written off.

The selection of spare parts to stock can best be made from a review of the equipment record cards, mentioned in a previous article on "Preventive Maintenance Pays Dividends," (P.I. Oct., 1950, p. 732). Here the important spare parts are listed by item of equipment. This will tell what items to stock; how many to stock may be determined by the number of machines using the same parts, and the actual or estimated usage.

How much to stock and order

Generally, maintenance stores are divided into three classifications:

(a) *Fast moving items:* These might include pipe fittings, nuts, bolts, washers, bar stock, sheet metal, paints, lubricants, fuses, brushes, and others.

(b) *Slow moving, relatively inexpensive spares:* These would include such items as roller bearings, thrust bearings, beater bars, doctor blades, knives, cutters, and similar items.

(c) *Larger, relatively expensive spare parts:* The average life of many of these far exceeds their replacement time. This would include Jordan fillings, pump impellers, conveyor belts and cables, rolls and roll bearings, 100 HP and larger motors, and other expensive items.

For each of these classes different methods are used for determining the order points and order quantities. For

the fast moving items, the order point can be calculated safely on past usage. Here the average number of pieces used per week, multiplied by the replacement time in weeks, will establish the order point, sometimes incorrectly referred to as the *minimum*. The order quantitiy, or amount of order, sometimes incorrectly called the *maximum*, should be determined by the formula for economic lot size, given in any standard production handbook. Quantity discounts and amount of storage space required should also be given consideration. A safe rule to apply to these items in establishing the order quantity is to provide for three stock turnovers per year.

On the slower moving, relatively inexpensive items, or those costing up to $50, the calculated order points based on usage and replacement time will often be less than *one*. Here the order point should be established at *one*, and the order quantity also placed at *one*, to assure that at least one of these parts will always be on hand or on order.

In the more expensive items, those costing $50 or over, sometimes up to $2000 or $3000, the maintenance superintendent must take a calculated risk and allow some of these items to run out of stock, if he is to keep his total investment in inventory at reasonable levels. We designate this class of stores as *zero* and *check* items. Here the maintenance superintendent is notified by the storeskeeper when the supply is exhausted. Based on the maintenance superintendent's knowledge of the condition of the equipment, he must make the choice of ordering at once or delaying his order for some specified time. He should be readvised by the storeskeeper when the date he has selected for reconsideration arrives. This same process may be repeated several times before actual purchase is made. These requisitions should be kept in a tickler file, and the maintenance superintendent advised each time the dates are reached.

What to call items in stores

The great variety of items kept in maintenance stores calls for some codifying to insure the use of standard nomenclature. Articles are known by different names, depending upon the manufacturer's title and the local parlance. This is particularly true of electrical replacement supplies, such as brushes, contactors, coils, and similar items. The best way to make sure that similar parts, referred to by different names, are in stock, is to assign your own names to each item in stores, and add their identifying part numbers. Lists of materials by name and code should be made, cross-indexed by the department and type of machine on which the part is used, and the lists distributed to all persons who are authorized to write stores requisitions. Using part numbers, rather than names, simplifies the posting and costing of issues and receipts; everyone in the plant is speaking a universal language.

Physical stores

The stores room should be placed in a central location adjacent to the shop, if possible. In a very large mill it may be necessary to have one or more auxiliary stores to reduce the travel time of mechanics drawing items from stores. The correct location and number of stores can be determined only after an analysis of usage and study of the plant layout. The faster moving items should be close to the issue window and the entire layout predicated on reducing the time of the mechanic at the issue window.

Adequate stores control can be maintained only if the premises are kept under lock and key. Spare parts should not be distributed promiscuously around the departments, but should be centrally located in stores, with adequate handling equipment provided so that issues of the heavier and more bulky items can be made with a minimum of delay.

Stores control

Unless the stores are manned 24 hours per day, a bin location index should be available so that night mechanics can locate items readily.

Articles ordered for capital or construction jobs should be segregated physically from the normal maintenance stores. These items should be tagged for proper identification and issued only for the job for which they were originally ordered.

In an article of this length it is not possible to describe all of the forms used for stores control. A well designed system should include a *Balance of Stores Card*. This card should bear the name and code number of the article, end use, order point, order quantity, and average unit cost. Columns should be provided for receipts, issues, balance on hand, and average unit cost, or actual unit cost, and dollar balance, depending on company accounting policies. All bins should be numbered and bear a bin label showing the article, name, code number, and order quantity. Items too large to be stored in bins should be tagged with this same information. A good way to insure that the physical balance will jibe with the card balance is to separate physically the order point quantity. When any balance on hand is reduced to the order point, a *Report of Order Point Reached* is sent to the stores records. This provides a signal for consideration of reordering, as well as an opportunity to check the card balance.

Over-all dollar control can be established by calculating a desired value for maintenance stores. This desired value for each item is obtained by multiplying half the order quantity by the unit price. The total of these individual values provides a theoretical, or desired, dollar value. This total should be recalculated every six months, as the number of articles kept in stores and the order quantities will vary with the extent of manufacturing operations, and with carrying delivery times.

Stores organization

In a previous article on "Maintenance Organization for a Paper Mill," (P.I. May, 1950, p. 165) we said that common practice in paper mills places the stores organization under purchasing. This organizational setup is satisfactory only if the maintenance superintendent has the responsibility for determining what he desires kept in stores, and if the order points are based on his estimate of usage. If either purchasing or accounting overrules him on either of these prerogatives, he should make every effort to have maintenance stores placed under his direction.

In the last analysis, the stores organization and service will be only as good as the personnel who operate it. There seems to be a common feeling that if a person cannot succeed in any other job in the mill, stores is the logical place to dump him. Storeskeeping requires careful, industrious, and well-trained personnel who are conscious that they are guardians of the property, and act accordingly. Only with this type of personnel can the basic objective be reached—having on hand *what* is needed, *when* it is needed, without exceeding the desired economic balance.

Paper and paperboard making—X

HARRY WILLIAMSON

Cylinder Machine . . . The Use of Baffleboards—Part 2

THIS AUTHOR HAS SELECTED for discussion three different arrangements of vat delivery in daily use on the same multiple type cylinder board machine. This machine runs at a top speed of 330 fpm when making No. 1 patent white, news back, 0.016 point caliper. The machine trims 108 inches and is operated by a company strictly competitive in the better grades of folding boxboard. This arrangement permits a range of operation between 0.012 and 0.035 without experiencing operating difficulties. *All* stock preparation is carefully and scientifically controlled by the best known modern practice.

All the cylinder molds are 42-inch diameter; the top liner vat is sketched to larger scale to make the adjustable controls more clear.

Filler Stock (Figure 4)

The arrangement of the filler stock vats using mixed papers as a furnish is shown. The stock enters at the bottom center of the rear compartment which is 8½ inches wide. This very much larger area than the supply pipe slows down the velocity of flow and distributes the mixed volume over the width of the vat. Only one horizontal baffle board is used in this compartment to quiet down the turbulence of the vertical flow. The opening through which the mixed volume must pass between the edge of the baffle board and the back wall of the vat is only 2½ inches wide. This CONSTRICTION *increases* velocity, creates dispersion of fibers and maintains distribution.

This horizontal baffle board is non-adjustable. The mixed volume then flows over the top of the vertical baffle board into the second compartment. The clearance between the top of this divider and the top of the vat, open to the atmosphere, is 7⅜ inches. The second compartment is divided into two different dimensional areas by an UNDERFLOW vertical baffle board making the receiving compartment 3½ inches wide and the delivery compartment to the making board 4½ inches wide. The underflow space is 5½ inches wide. Contraction and expansion to control velocity and maintain dispersion without flocculation. Flowing vertically from this compartment the mixed volume breaks into a horizontal flow direction on coming in contact with the wing control boards which are affixed to the lead edge of the horizontal making board. The clearance between the top of the making board and the open top of the vat is 4½ inches. Flowing over the making board, the mixed volume enters

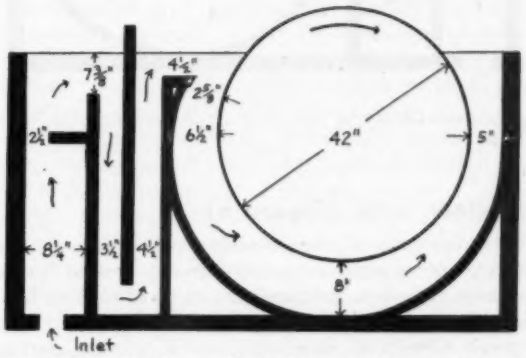

Fig. 4—Counterflow type vat. Used on mixed paper stock. Top speed 330 fpm

the circle with a directional flow influenced by the adjustment of the wing boards.

At the actual ENTRANCE to the formation circle the clearance between the delivery lip of the making board and the revolving surface of the cylinder mold is only 2⅝ inches, very slightly wider than the velocity orifice in the first compartment of the vat. This clearance EXPANDS RAPIDLY to 6½ inches and then *gradually* expands to a maximum of 8 inches at the bottom vertical diameter of the cylinder mold. Flowing round the formation circle against the rotation of the mold, the mixed volume enters the BACK CIRCLE which gradually *reduces* the clearance to 5 inches at the horizontal diameter of the mold. At the point where formation actually COMMENCES the clearance is from 5 to 6 inches according to the height of operating head carried.

It will be noted in all the three vats described the flow of the mixed volume from the point where it enters the BACK CIRCLE to a point in *line* with the horizontal diameter of the revolving mold the area is *gradually restricted*. From this diametrical line to the point of INITIAL FORMATION the flow area is *gradually expanded* in *ratio* to the arc of the circular mold in relation to the vertical wall of the vat.

At the initial formation point the objective is to have absolutely *no* turbulence. Complete dispersion of fibers and distribution of mixed volume has been achieved; the ONLY FLOW MOVEMENT DESIRED at this point is that movement actuated by the flow of water through the wire mesh in the act of INITIAL FORMATION. When such a flow condition is maintained in continuous supply then the vat is well designed for the operating conditions.

The filler stock on the long fibered side and therefore of relatively free stock behavior, this vat is designed to handle larger volumes of water than the sub-liner vat with its shorter fibered and sometimes clay loaded furnish.

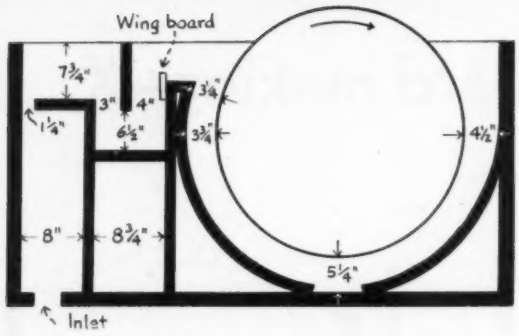

Fig. 5—Counterflow type vat. Used on sub-liner stock. Top speed 330 fpm

Sub-liner vats (Figure 5)

Arrangement of the sub-liner vats using fly leaf shavings of semigroundwood, semiclay loaded furnish is shown. The flow action of this type of furnish has a tendency to be sluggish, dispersion of individual fibers is more difficult to maintain and flocculation, particularly of clay and coating materials, is apt to be more prevalent causing slime spots and lumps. Because of the slow formation behavior excess volume can not be used as is the case with filler stock.

As a consequence the flow areas are generally smaller in total dimensions and the VELOCITY THROTTLES are made smaller to *increase* turbulence at these points as an aid to the creation and maintenance of dispersion. Regardless of the dimensions the PRINCIPLE of application and the OBJECTIVE to be achieved are the *same*. This vat is of particular comparative interest with the filler type vat; they *both* are required to make an equal number of points caliper if necessary, but, in addition, the sub-liner has sometimes to make a tighter and less bulky formation.

It will be noted that the back compartment is 8 inches wide, the single horizontal baffle board is set up to the top of the vertical dividing board leaving a clearance of 7¾ inches between the top of these two joined baffles and the top of the open vat. The clearance between the edge of the horizontal baffle board and the back wall of the vat, the velocity throttle for dispersion of the fibers, is only 1¼ inches as compared with 2½ inches for the same function on the filler stock vats.

Flowing into the second compartment of a total of 8¾ inches in width we find this is divided into two compartments by an underflow vertical baffle board. The receiving half of this divided compartment is 3 inches wide and the discharge half is 4 inches wide; the space allowed for underflow is 5 inches wide over the full cross sectional area of the total compartment. This compartment is fitted with a false bottom so that only *half* the total *depth* is in use. If the total area of this compartment was used with this slow acting and sluggish stock, much settling of loading materials and flocculation of fibers could take place which would occasionally break away as slime spots or lumps. The wing boards and making board are in similar arrangement to those of the filler stock vats. However, there is a larger entrance to the formation circle: 3¼ inches as compared to 2⅝ inches for the filler vats. A GRADUAL EXPANSION of the circle area to 3¾ inches with a *still further* gradual expansion of the circle area to a maximum of 5¼ inches clearance between the bottom vertical center of the revolving mold and the surrounding circle at this point. A cut away in the circle at this point will be noted. The function of this area is to catch any fine dirt or particles of clay which may settle out of the mixed volume as it flows up the back circle to the GRADUAL RESTRICTION of the 4¼ inches clearance at the horizontal diameter of the revolving mold. Such is the arrangement for this type of sluggish slow formation behavior stock. Incidentally, as low as 0.0025 points caliper with excellent coverage can be formed on this arrangement of baffle boards and circle formation area.

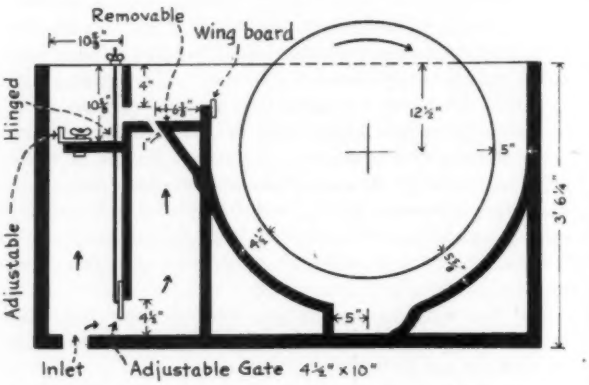

Fig. 6—Counterflow type vat. Used on top liner stock for folding boxboard. Top speed 330 fpm

Top liner vat (Figure 6)

Arrangement of the top liner vat using bleached sulphite and soda pulps with clay loading as a furnish is illustrated. This mold has to produce a first class formation of high printing and folding quality. The flow and formation action is on the free side because in the beating the sulphite is kept well brushed out to the full natural length of the fibers in order to give a good bender. Rather than cut up the fibers, soda pulp with its natural short fiber is used as an aid to formation. However, soda pulp does not accept hydration, so the net result is a semi-free stock. The short fibered soda pulp is easily kept in dispersion by very little turbulence but the longer fibered sulphite requires more action to keep the fibers from bundling together. As this vat has also to form a sheet from 100 per cent unbleached sulphite, a fiber which DOES HYDRATE READILY in the beating and, therefore, a slow formation behavior furnish; *extra* adjustment facilities are provided to control the wide difference in the volume of water used to produce the *same* number of pounds per minute production. This arrangement has been in operation for many years and has proven to be a most suitable and satisfactory arrangement of the counter flow vat for operations over a reasonably wide range of slowness and ream weights.

The receiving compartment of the vat in which the mixed volume enters at the bottom center is 10⅝ inches wide. The single horizontal baffle board in this compartment is also 10⅝ inches from the open top of

the vat. This baffle board is hinged so that it can be raised for clean out. For operating control of the velocity throttle width, the distance between the edge of the horizontal baffle board and the back wall of the vat, this board is also equipped with an adjustable slice. By this adjustment the velocity throttle may be operated at full opening of 2½ inches or any part thereof down to one half of one inch if necessary. At the bottom of the inner wall of the back compartment an adjustable gate, leading to the second compartment, is provided with a maximum opening of 4½ x 10 inches. Through this gate any proportion of the mixed volume desired may be admitted at will to the bottom of the second compartment. The area of receiving volume is therefore increased at will and turbulence and velocity are under control in either compartment for increase or decrease.

We, therefore, have *two* vertical flows in operation at the same time, both flowing in the same direction. The flow from the back compartment, passing the throttle velocity area, flows under a small *underflow* vertical baffle board set directly over the vertical baffle board dividing the two compartments. The clearance for stock flow of this opening is 3¼ inches. A head may be built up *behind* this underflow baffle to accelerate horizontal flow if necessary. Simultaneously, the stock is flowing vertically through the second compartment and passes through the slotted opening only one inch wide. This opening is set at an angle so that the flow force of the second compartment directly intercepts the flow force, traveling on a horizontal plane, of the mixed volume from the back compartment. The net result of the intermingling of the flow forces of these two mixed volumes is a negation of horizontal flow speed and a creation of intermingling spreading circles which provide complete dispersion with minimum velocity. Of course, any degree of application of the flow forces of the two volumes, one against the other, may be obtained.

It will be noted that this vat is not equipped with a making board and the wings are set on the forward edge of the vertical wall of the formation circle. So relatively placid the horizontal velocity of flow speed and so thoroughly dispersed the fibers by these intermingling forces, a making board was found to be of no advantage and the placing of the wing boards control immediately over the entrance to the formation circle was found to be capable of fine adjustment.

The entrance to the FORMATION CIRCLE has a clearance of 4¼ inches, *gradually* expanding to only 4½ inches and with a *further* gradual expansion to 5⅝ inches. This final expansion takes place *beyond* the bottom vertical diameter of the revolving mold and on the up slope of the *back circle*. Gradually reducing to 5 inches clearance, the total back circle is only slightly larger in operating area than the front circle. This is a most efficient and flexible arrangement of the counterflow type of cylinder mold operation. In conjunction with the operations of a well controlled beater room this liner mold has produced first class quality for many years and is still in competitive operation.

Here are the answers to some legal questions

Recent court decisions in lawsuits involving the paper and pulp industry provide legal guidance for executives

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Attorney at Law

▶▶▶ CONSIDERABLE DISCUSSION has arisen from time to time over the legal question: If a consignor *fails* to comply with the bill of lading and does not send a common carrier written notice of loss or damage to shipped merchandise, is the carrier liable? The answer is: Yes, *if* the testimony shows that the carrier had actual knowledge of the condition and damages that a written notice could supply.

For example, in Hopper Paper Co. v. Baltimore & O. R. Co., 178 Fed Rep. (2nd) 179, it was shown that the Hopper Paper Co. shipped a carload of paper under a bill of lading which provided that as a condition precedent to recovery for damage or loss of the shipped paper the claim must be filed in writing with the receiving or delivering carrier within nine months after shipment of the paper.

The Hopper Paper Co. sued the carrier for full value of the paper which was destroyed in a railway wreck between two of the carrier's trains. The carrier had refused to pay the claim amounting to $4,224 because the company had failed to file a claim in writing within nine months, as required by the bill of lading.

The testimony showed that eight days after the paper had been shipped the carrier notified the company by wire that the shipped paper had been destroyed in an accident. Then one year later the carrier received a letter from the company and a written claim for $4,224.96 for the loss of the paper.

Although the company had failed to file the written claim within nine months, the higher court held the carrier liable and said:

"The purpose of the stipulation is not to escape liability, but to facilitate prompt investigation . . . It is undisputed that defendant (carrier) was fully aware and cognizant of the existence of all the facts concerning the wreck and destruction of the carload of paper. In such a situation, a formal notice by plaintiff (consignor) to the defendant (carrier) could not have accomplished anything more."

For comparison, see Lehigh Valley R. Co. v. State, 21 F. (2d) 396. Here the testimony showed that a carrier wrote a letter to the shipper advising him that the shipped goods had been destroyed.

In subsequent litigation the court held that since the carrier had knowledge of the loss which it had reported to the consignor, the latter could recover the full value of the destroyed merchandise although the shipper had failed to comply with the terms of the bill of lading and did not send the carrier a written notification of the loss. This court said:

"We conclude that the carrier may not use the provisions of the bill of lading to shield itself from the liability

imposed upon it by the statute and the common law for its negligent destruction of the shipper's property. To hold otherwise would not be construing the bill of lading 'in a practical way.' "

Trespasser cuts trees

Recently a reader asked these questions: "If a paper company pays a property owner for a contract right to cut 'timber' on the property, can the company cut all trees? Also, can he use the tops, branches, etc. for pulpwood? If one trespasses on private property and cuts trees made into pulpwood, paper, etc. what amount of damages can the property owner recover from the trespasser?"

According to a recent higher court the term "timber" means trees capable of being sawed profitably into lumber. Moreover the term "timber" does not include small trees, branches or tops of trees cut for lumber.

For example, in Union Bag & Paper Corp. v. Mitchell, 177 Fed. (2d) 909, the testimony showed facts, as follows: A property owner named Mitchell sued the Union Bag and Paper Corp. to recover damages in the sum of $100,000 for the conversion of timber. Mitchell based his suit on the fact that the Union Bag and Paper Corp. had cut timber *not included* in their contract. This contract specified that the corporation could cut all long leaf and slash pine with two or more turpentine faces and all hardwood timber suitable for lumbering. Another provision in the contract provided that the corporation could cut pulpwood or other low grade, low price material from any trees which they may cut under the above clause, but that they could not cut timber merely for pulpwood purposes.

The higher court indicated that the company is liable for all timber cut exclusively for pulpwood except the tops and branches of trees already cut for lumber. This court said:

"As a general rule the word timber means such trees as are fit to be used in buildings or similar construction. . . . 'Suitable for lumbering' here means suitable to be sawed into lumber."

For comparison, see Neal Lumber and Manufacturing Co. v. O'Neal, 166 S. E. 647, 649. Here the higher court construed a contract which specified that a company could cut all timber of every kind and description upon the described land. The court held that *only* "saw" timber was meant by the term timber in the contract, and not trees that grew into dimensions suitable for lumber *during* the *period* of the contract.

In other words, the company was not allowed by the court to cut trees that grew into lumber timber *after* the contract was signed.

And again see Pennington v. Avera, 52 S. E. 324. Here the higher court held that when timber is sold for "sawmill purposes" the purchaser has no right to use the tops and branches for pulpwood or cordwood, or otherwise remove the tops and branches from the premises unless a clause in the contract clearly gives the purchaser this right.

Hence unless a contract contains a definite clause that the purchaser can cut and use the tops and branches for pulpwood, he has no right to use the branches and tops for any purpose, or remove same from the premises.

Law of trespasser

An important point of law relates to the liability of one who trespasses on private property and illegally cuts trees. See Bolles Wooden-Ware Co. v. United States, 106 U.S. 432; and Tennessee Co. v. Zugar, 18 S. E. (2d) 758. These courts held that before trees are cut they are real property, but after cutting they are personal property. Also, these courts held that if a trespasser illegally cuts trees and then converts the wood into paper, bags, boxes, and the like, the property owner can sue and recover from the trespasser the *value of the paper,* bags and boxes. Here is the law: (1) If a person is a wilful trespasser, and cuts trees, the property owner may recover the full value of the cut trees without any allowance for the labor or other expenses incurred by the trespasser. (2) Where a person is an unintentional or innocent trespasser the property owner may recover the value of cut trees at the time of the conversion. (3) Where a person is a purchaser of trees without any notice that the seller is a wilful trespasser the property owner may recover the full value of the trees plus damages effected the real property.

Offer and acceptance

All higher courts agree that a valid contract can be made only when one party unconditionally accepts an offer made by the other party.

For example, in Calcasieu Paper Co., Inc. v. Memphis Paper Co., 222 S. W. (2d) 617, the testimony showed facts, as follows: The Memphis Paper Company had been buying paper from the Calcasieu Paper Co. for twenty years under a very friendly relationship. The purchaser sent the seller several orders for a large quantity of paper. The seller sent the purchaser printed acknowledgments. Printed in large red type across the middle of the form are the words "Acknowledgment of Order." On the form was a typewritten clause, as follows: "Shipment subject to prior orders. This order is being entered for shipment when our schedule permits, and no specific promise as to delivery can be made at this time.

Also, the form contained this clause: "General Conditions: All agreements are contingent upon strikes, accidents, delays of carriers and other hindrances unavoidable or beyond our control . . ."

The seller refused to deliver the shipments of paper ordered by the purchaser and the latter filed suit for several thousand dollars.

The seller defended the suit, first, on the contention that there was no definite contract particularly because of the above mentioned clauses in the printed form. However, in view of the fact that over the past many years the seller had shipped orders acknowledged on the same kind of printed form, the higher court decided that this form was a valid acceptance of the purchaser's order. In holding the seller liable to the purchaser for an amount equal to the profits tthe purchaser would have earned had the seller delivered the paper the higher court said:

"We have a long course of dealing and many like transactions over the years where merchandise has invariably been delivered on this form of document without further communication between the parties. . . . We are not dealing with one isolated transaction where we are confined to the document itself on which the parties have never acted. . . . On the other hand, it nowhere appears that appellant (seller) ever rejected an order or stated that it would do otherwise than ship when conditions permitted. It seems to us, therefore, the conduct and course of action of the parties shows unequivocally an implied acceptance."

As to the contention of the seller that the contract was void because no definite date was given as to when the paper would be delivered, the higher court said:

"The rule is well established that when no definite time for performance of a contract is specified, the law will imply a reasonable time. . . . It is a necessary corollary of the rule that when a reasonable time under the contemplated circumstances has elapsed, the promisor (seller) must perform or be held to have breached the contract. . . . We, therefore, affirm and enter judgment here for appellant (purchaser) for $6,-140.22 with interest from rendition in this court with costs against appellant (seller)."

For comparison, see Gill Mfg. Co. v. Hurd, 18 F. 673. Here the testimony showed that a sale contract for paper contained a clause that "due to uncertainty of manufacturing the subject of sale there is no guarantee as to when delivery will be made."

In subsequent litigation the higher court held the seller liable in damages to the purchaser for failure to make delivery in a "reasonable" time. This court stated important law, as follows:

"The expression 'due to the uncer-

tainty of manufacturing' did not relate to an uncertainty as to intention to manufacture at all, but to the uncertainty as to the time when, in view of prior orders and existing factory conditions as to labor and material, the goods could be produced."

And again in Automatic v. Sherman, 294 F. 533, the contract expressly stated that "due to existing conditions" no time for performance was promised.

The higher court held that this clause did not destroy the binding effect of the contract on the seller who must make delivery within a "reasonable" period of time.

This court also explained that in cases of this kind the jury may listen to all testimony and then decide what is a "reasonable time" in which the seller must make delivery.

See Thompson v. Woodruff, 47 Tenn. 401; Wildberg Box Co. v. Darby, 223 S. W. 855; Memphis Mfg. Company v. Wemyss, 2 F. (2d) 428, 431. This court held that the meaning of "a reasonable time" may be determined by testimony as to what the buyer and seller contemplated at the time of formation or signing of the contract.

Total disability

According to a recent higher court an employe who is injured to a degree or extent that he cannot expect future promotions is totally disabled.

For example, in Perkins v. Brown Paper Mill Co., Inc., 43 So. (2d) 501, it was disclosed that one Perkins was an employe of the Brown Paper Mill Co., Inc. While engaged in his duties in the machine room at the company's West Monroe plant, he suffered a right inguinal hernia. After an operation and seven weeks convalescence, he returned to work at the mill. A recurrence of the hernia occurred, and after a second operation he returned to his employment at the mill and continued to work there regularly until he sued to recover compensation under the State Workmen's Compensation Act for total and permanent disability.

Perkins' contention was that he not only is unable to perform the work in which he was engaged when injured, but also that he cannot satisfactorily perform the duties required of machine room helper, and since this is the next step in the promotional ladder above that of starch cooker, where he was employed at the time of the trial, he will be permanently prevented from receiving any promotion, and thus be deprived of the normal advancement that would have been his had he not been injured or had the post-operative complications not occurred.

The higher court agreed and awarded Perkins compensation for total and permanent disability.

Pulpwood preparation in Scandinavia

Observations on peeling of pulpwood and sawlogs in the Scandinavian countries

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▶▶▶ ONE OF THE MOST striking things for the American visitor to European forests and forest industries is that practically all wood used for industrial purposes, whether for sawing or pulping, is peeled in the forest.

This, of course, involves much labor, but has a number of advantages. Sawlogs and pulpwood often are left in the European forests for a much longer time than in the United States, and if not peeled there would be epidemics of insects such as bark beetles and borers in the unpeeled wood, with attendant loss in quality, and the further danger of the insects moving from the unpeeled material to nearby standing timber. This is especially true with conifers such as pine, fir, and spruce.

Skidding in several central European forests is done in full tree lengths with horses or oxen, and the peeling makes the skidding easier because of less friction and less weight. The end of the log is often rounded off to a "torpedo-shape" to further facilitate skidding and to reduce injury to standing trees and reproduction.

Peeling has the advantage of allowing partial drying of the wood, thus minimizing chances of undesirable sap stain or rotting of the wood. Peeled logs lose moisture much faster and to a greater extent than unpeeled wood, and to the Europeans the reduction of weight by drying is an important factor in reducing costs of loading and transportation of the wood.

The predrying accomplished by peeling also results in less loss by sinkage in the floating or rafting of logs or pulpwood, especially in Sweden, Norway, and Finland where most of the wood is transported by water to the mills.

My European guides also mentioned that the peeled wood does not hang up in river floating or cause log jams as readily as rough wood. In some instances, the squared-off ends of bolts or logs scheduled for driving are slightly rounded-off to reduce brooming, splintering, and their chances of hanging up on rocks or other obstructions in the stream.

Swedish experts pointed out that peeled aspen and birch has been successfully stored for as much as three years in pulpwood piles, with practically no loss from rot. On the other hand, unpeeled wood of these species can be held for only about one or two years at the most; often one year is the practicable time limit for storage without considerable deterioration. The period is likely to vary by geographic locality because of climatic differences and other variables.

Predrying of peeled aspen in the woods in small piles is deemed by the Scandinavians to be of great importance later in reducing decay of wood in larger piles in the mill yards. However, predrying of unpeeled aspen in the woods is not regarded as especially beneficial or effective in this respect.

Water transport of peeled aspen and birch, predried in the woods, is believed to have a somewhat adverse effect on keeping qualities of the pulpwood in subsequent storage because of accretion of moisture content of the wood during floating or rafting. In the period subsequent to rafting or floating and before fabrication in the mill, there is little opportunity to again dry the wood to a moisture content as low as it had been before floating. To do so would probably require special methods of piling the wood in the mill yard. No formal experiments on the subject, however, have been initiated along this line in Sweden, according to my informant.

Experiments are now under way in Sweden to test the possibility of chemical treatment of logs to reduce decay in storage, and also on the usability of partially decayed wood for pulping purposes.

Recent increases in freight rates in the United States and Canada, coupled with the increased use of pulping species highly susceptible to rot, such as aspen, birch, and other broadleaf species, will no doubt add impetus to the development and wide-scale use of mechanical pulpwood peelers in the woods and to the predrying of pulpwood before shipment. Besides a considerable saving in freight, reduced losses from rot and insects can be expected of wood stored in the mill yard.

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(**) Maintained by the U. S. Department of Agriculture, Forest Service in co-operation with the University of Minnesota, University Farm, St. Paul, Minn.

Lubrication

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Application Engineers
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Part 10 of a series

▶▶▶ IN AN ORDINARY cylindrical or sleeve bearing, there is always a sufficient running clearance between bearing shell and journal to provide for a lubricating oil film. In a bearing of this type there is present, due to the relation of the curved surfaces and to capillary attraction of the oil particles, a *pumping* action, resulting in the lubricating oil being drawn in between the rotating journal surface and the inner bearing shell surface (Figure 1). Where the oil is of correct viscosity, it will resist the breakdown of the oil film except at excessive loads. It is only necessary to provide a positive and ample supply of cool oil to the bearing—ordinarily by a simple gravity device, although in cases of the highest speeds resulting in maximum tendency to heat, some form of forced feed lubrication is used.

With an ordinary thrust collar, however, under high pressures and speeds there is a tendency for the parallel surfaces to squeeze out this oil film, which would result in metal to metal contact. This type of bearing is, therefore, not suited to heavy loads.

Kingsbury type thrust bearings

For heavy loads and high speeds, the Kingsbury mechanical thrust bearing may be used. It is designed as follows: Suppose that first a circular collar is cut into little segments. Each block is suitably supported on its under side to permit it to rock slightly on the point indicated as the suspension point, suitable means having been provided to retain these blocks in location. When the rotation of the shaft begins, there is a tendency, due to friction, for the film of oil to be dragged in under the slightly rounded edges of the blocks.

As the speed increases, this tendency increases, the block adjusting itself slightly by tipping at a greater angle, and a certain action of riding up on the oil film takes place which can be likened to that of a sled runner riding up as it meets the surface resistance of snow underneath (Figure 1). The higher the speed, the greater this tendency to rock forward permitting an increased "sledding" action, and an increasing tendency to adjust itself to the increasing oil film being dragged under. Construction de-

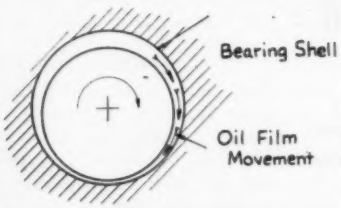

Fig. 1 Ordinary cylindrical bearing with oil film formed by the pumping action

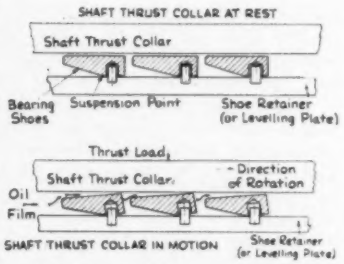

Fig. 2 Schematic diagram—principle of Kingsbury thrust bearing

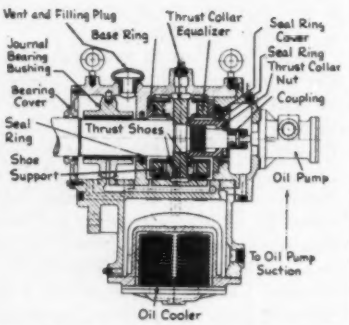

Fig. 3 Sectional assembly of Kingsbury type thrust bearing

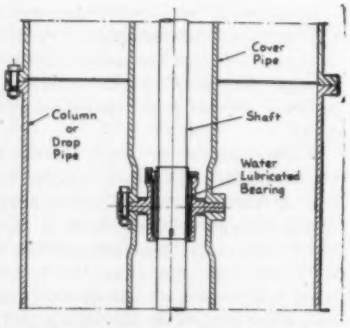

Fig. 4 Water lubricated vertical wet pit pump bearing

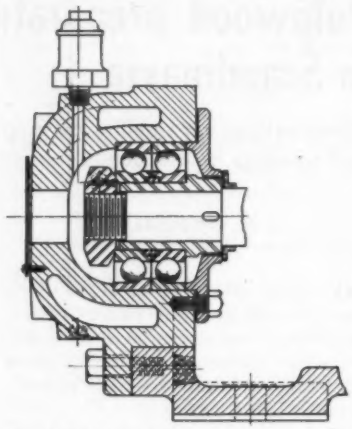

Fig. 5 Double row angular contact ball thrust bearing—grease lubricated and watercooled

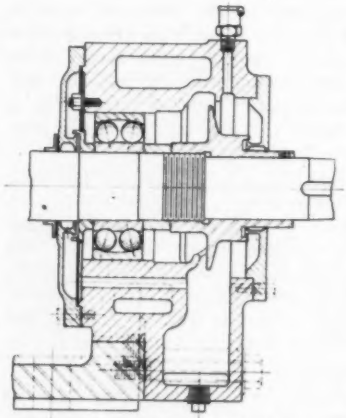

Fig. 6 Double row self-aligning ball bearing oil lubricated and watercooled

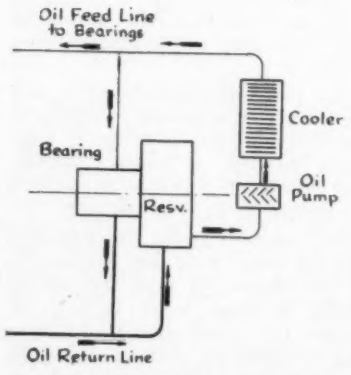

Fig. 7 Typical forced feed lubrication oil piping diagram

# of centrifugal pump bearings

tails of a typical Kingsbury bearing can be examined closely in the sectional assembly shown in Figure 3.

Tests of Kingsbury bearings show them to be capable of taking care of unit thrust loads and high linear speed so far in excess of the ordinary straight collar thrust that there is no near comparison between the two. Their cost is relatively high, however, and, therefore, their use, except where extreme thrust conditions are present, is not warranted.

Bearing lubrication

In the layout of a line of centrifugal pumps, the choice of the type of lubricant for the pump bearings is dictated by the application requirements, by cost considerations and, in certain cases, by the preferences of the group or purchaser which would absorb the major portion of the output of that line.

For example, in the case of vertical wet pit condenser circulating pumps (Figure 4), the application dictates the choice of water lubricated bearings in preference to grease or oil lubrication. In this case, if oil or grease were used and leakage of lubricant into the pumping system were to take place, the condenser operation might be seriously affected because the tubes would become coated with lubricant.

Lines of centrifugal pumps for refinery service are, at present, almost in the majority supplied with oil lubricated bearings because of the insistence of the refinery engineers for this feature. In the marine field, on the other hand, preference lies with grease lubricated bearings. For very high pump operating speeds (5000 rpm and above) oil lubrication is found to be most satisfactory.

For highly competitive lines of small pumps, the main consideration is cost and the type of lubricant is chosen to give the lowest cost, depending upon the type of bearing used.

Ball bearings used in centrifugal pumps are generally grease lubricated, although for some types of application, oil lubrication is frequently applied. When grease lubrication of bearings is used, grease is packed into the bearing and the rotation of the balls throws it out of the bearing proper and creates a slight suction at the inner race. Even though the grade of grease used for the lubrication of ball bearings is relatively light, it is semi-solid and flows slowly. As heat generates in the bearing the flow of the grease is accelerated. This grease is then thrown out at the outer race by the rotation of the balls and is cooled by

One of the most widely used classes of equipment in pulp and paper mills are centrifugal pumps. Because of this THE PAPER INDUSTRY, in August 1949, started a series of articles on the practical fundamentals of centrifugal pumps. So far, ten such articles have been published and several more will appear in THE PAPER INDUSTRY during 1951. To bring you up to date, here are the subjects already covered: Types of pumps and how they work, Aug. 1949; centrifugal pump casings, Sept. 1949; multistage pumps, Oct. 1949; impellers, Dec. 1949; axial thrust studies, Feb. 1950; shafts, April 1950; stuffing boxes and packing, July 1950; mechanical stuffing box seals, Aug. 1950; types of bearings, Oct. 1950; bearing lubrication, Dec. 1950. Some of the subjects yet to be covered are: Couplings and bedplates, vertical dry pit pumps, vertical wet pit pumps, materials of construction, pump capacities, pump characteristics, and maintenance.

contact with the housing. There is, therefore, a continuous circulation of the grease and the bearing is kept lubricated and cooled. This method of lubrication requires the minimum amount of attention and has proven itself very satisfactory.

The housing of bearings of vertical pumps require seals to prevent the escape of the lubricant, and grease is generally preferred as there is less chance of leakage.

A grease lubricated ball bearing should never have its housing fully packed with grease, as it prevents the proper circulation of the grease in the bearing and its housing. As a rough rule, it is recommended that the void spaces in the housing be ⅓ filled with grease. An excess amount of grease will cause the bearing to heat and grease will flow out of the seals to relieve the situation. Unless the excess grease can escape through the seal or through a relief cock used on many large units, there is probability that the bearing will fail early. In general, when the bearings are grease lubricated, there is more trouble caused by an excess of lubrication than by lack of lubrication. Thus, we have the exceptional case where too much attention is worse than too little.

Forced feed lubrication

When a ball bearing is oil lubricated, it becomes necessary to provide an adequate method for maintaining suitable oil levels at the bearing. The level of the oil should be at about the center of the lowermost ball in the bearing when the latter is stationary. This may be accomplished by a dam to keep the oil level just right (Figure 6) and an oil slinger to maintain the level behind the dam and so increase the leeway in the level at which the operator must keep the oil in the housing.

A provision for automatically circulating the oil and, where necessary, for cooling it, is an essential feature of a Kingsbury type thrust bearing. In the bearing shown in Figure 3, the oil circulation is effected by a rotary positive displacement gear pump directly connected to the outboard end of the pump shaft by means of a flexible coupling. The oil pump takes the oil from a reservoir located either in the bearing housing itself or separately on the pump baseplate and delivers it under pressure through the cooler. From the oil cooler, the lubricating oil flows in part to the outboard thrust bearing from which it overflows into the reservoir located in the lower half of the bearing housing. It overflows by gravity from this reservoir into the main reservoir on the baseplate. This lubricating system is illustrated in Figure 7.

When using such a lubricating system, it is generally the practice to supply the inboard line bearing with oil under pressure. This is accomplished through a branch line in the discharge from the oil cooler. The oil from the inboard bearing is returned by gravity through large return lines into the main reservoir. This provides an adequate pressure drop from all bearings, thus avoiding danger of oil leakage by overflow because of unsatisfactory evacuation.

There are obviously numerous alternate methods both for supplying the bearing with forced feed lubrication and for cooling the oil. Some arrangements use a vertical oil pump driven from the main pump shaft by means of a worm gear. Other bearings employ the Kinsbury pumping ring which surrounds the thrust collar and dips into the oil bath. Oil clinging to the periphery of the collar is carried around inside the pumping ring and is forced into the thrust bearing cavity and the journal bearings.

Insulating board from Douglas fir and alder

SIDNEY L. SCHWARTZ

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▶▶▶ COARSE PULPS for insulating boards are of considerable interest for possible utilization of Douglas-fir logging and sawmill wastes. Previous work indicated that important differences in pulp quality were obtained from Western hemlock and from old-growth Douglas-fir, with the latter producing pulps of lower quality. (Schwartz, S. L., Pew, J. C., and Schafer, E. R., *Tech. Assoc. Papers*, 30, 417-422. 1947.) The purpose of this study was to learn to investigate the effect of incorporating a relatively strong pulp as a means of obtaining acceptable insulating-board stocks from Douglas-fir, and to determine the relative merits of old- and second-growth wood for such stocks.

Nominal ½-inch insulating boards were made from both milled raw and from steam-cooked old-growth and second-growth Douglas-fir chips, without and with the addition of red alder neutral sulphite semichemical pulp. These boards were tested for flexural and tensile strengths, water adsorption, water permeability, and linear expansion.

The basic problem in making a satisfactory board stock is to obtain sufficient strength in the stock by processing without imparting too great a degree of slowness to it. The use of a relatively strong pulp as an additive, provides a means of obtaining such quality with otherwise unsatisfactory board stocks. Even acceptable stocks are improved by such procedure, and the degree of improvement may permit substantial reductions in board densities in many cases.

It appears, on the whole that second-growth Douglas-fir is a more suitable material for insulating-board stock than old-growth Douglas-fir, both in the raw and in the steam-cooked state. Steam-cooking of Douglas-fir, irrespective of the type, to yields of 77 per cent reduced the power required for processing; but, however, it increased the degree of fragmentation in both types of wood, especially in the old-growth wood. Under less drastic cooking conditions, the differences between old- and second-growth material may be minimized.

(*) Forest Service U. S. Department of Agriculture, maintained at Madison, Wis., in co-operation with the University of Wisconsin.

Table I—Properties of insulating boards from fiberized old- and second-growth Douglas-fir chips and from an admixture of these with red alder neutral sulphite semichemical pulp.

Furnish		Milling data			Insulating-board data[1]							
Material	Amount	Run No.	Energy consumption[2]	Oliver freeness	Board No.	Breaking load	Tensile strength	Ratio of breaking load to energy consumption	Ratio of tensile strength to energy consumption	Water absorption	Water permeability	Linear expansion
	Percent		Hp.-days per ton	Sec.		Lb.	Lb. per sq. in.			Percent	Percent	Percent
Old-growth Douglas-fir	100	585	38	65	711	16.0	250	0.4	7	4	18	0.3
Old-growth Douglas-fir	80	584	31	44	717	16.1	240	.5	8	4	17	.2
Red alder semichemical	20	590										
Old-growth Douglas-fir	70	584	35	56	718	20.2	330	.6	9	4	17	.2
Red alder semichemical	30	590										
Steam-cooked old-growth Douglas-fir	100	587	18	126	713	15.0	230	.8	13	4	15	.3
Steam-cooked old-growth Douglas-fir	90	586	17	47	715	13.1	210	.8	12	4	16	.2
Red alder semichemical	10	590										
Steam-cooked old-growth Douglas-fir	80	586	21	65	716	16.5	260	.8	12	4	16	.2
Red alder semichemical	20	590										
Second-growth Douglas-fir	100	606	31	58	729	18.1	270	[3].6	9	4	19	.2
Second-growth Douglas-fir	80	605	30	54	732	16.6	280	.6	9	5	22	.1
Red alder semichemical	20	590										
Second-growth Douglas-fir	70	605	33	63	733	20.8	340	.6	10	4	20	.1
Red alder semichemical	30	590										
Steam-cooked second-growth Douglas-fir	100	563	16	34	698	16.5	260	1.0	16	5	17	.3
Do.	100	[4]562	24	113	709	21.1	350	.9	15	5	20	.4
Do.	100	[4]618	19	36	761	12.8	250	.7	13	5	16	.3
Steam-cooked second-growth Douglas-fir	80	618	27	48	762	19.9	360	.7	13	5	22	.1
Red alder semichemical	20	590										
Steam-cooked second-growth Douglas-fir	70	618	30	57	763	24.9	490	.8	16	5	24	.2
Red alder semichemical	30	590										
Specifications for 1/2-inch insulating board[5]												
Class A - building board	.....	.....	.....	.....	.....	[6]12.0	[6]150	.....	.....	[7]7	.....	[7]2.5
Class B - sheathing board	.....	.....	.....	.....	.....	[6]14.0	[6]150	.....	.....	.....	[6]20	[7]2.5

(1) Tests made on nominal ½ inch thick boards of approximately 20-pounds-per-cubic-foot density. Transverse breaking load corrected to a density of 20 pounds per cubic foot and thickness of ½ inch by the formula: Corrected load=measured load x 20^2 (0.5)^2/ (measured density)^2 x (measured thickness)^2. Tensile strength corrected to a density of 20 pounds per cubic foot on the assumption that it varies as the square of the density. Tests made according to Federal Specification LLL-F321b, Dec. 17, 1942, except for minor deviations. Boards sized with 3 per cent rosin size at a consistence of 1.3 per cent at and a pH of 5.1 to 5.6.

(2) Based on oven-dry material charged and an energy consumption of 85 per cent of the energy absorbed by the mill. B-957 plates were used, and the mill was run in the counterclockwise (brushing) direction.

(3) Value slightly high. Average value of several runs under varied conditions was closer to 0.5.

(4) Low strength due to the loss of fines. See Table 2.

(5) Federal specifications for fiberboard: Insulating LLL-321b (Dec. 17, 1942).

(6) Minimum test requirement. (7) Maximum allowable value.

Experimental Work

Raw chips from old-growth and from second-growth Douglas-fir, after attrition milling, produced insulating boards meeting sheathing-board strength specifications. The freeness of the pulps was, generally, in the upper range of Oliver values. The energy input in milling to produce sheathing-grade stock was calculated to be approximately 28 and 35 horsepower-days per ton for second- and for old-growth wood, respectively. Some of the difference in energy consumption of the two types of raw wood may be attributed to the large chip size of the old-growth wood, which necessitated two-pass refining.

The addition of alder semichemical pulp in amounts of 20 and 30 per cent to pulps prepared from milled raw Douglas-fir chips produced stronger boards than those made from the milled raw wood alone. The strength increase, however, was greater with the old-growth fir than with the second-growth. The freeness of these pulp mixtures were within the acceptable range for conventional board machines.

Steam-cooked old- and second-growth Douglas-fir chips each produced boards having the strength requirements of sheathing board. The energy consumption was about one-half that required by the raw chips to produce essentially the same board strength. The sheathing-grade stock prepared from the steamed, old-growth chips, however, was much too slow to meet the drainage-rate requirement for conventional board machines. The addition of 20 per cent of alder semichemical pulp to moderately milled, steam-cooked, old-growth Douglas-fir chips produced a board meeting strength requirements of sheathing board. The pulp mixture was in the acceptable range of Oliver freeness.

The old-growth Douglas-fir was chipped mill waste. These chips were, in general, considerably larger than the ⅝-inch chips normally used at the Laboratory.

Several bolts of second-growth Douglas-fir were converted to ⅝-inch chips at the Laboratory.

The neutral sulphite semichemical pulp was prepared from ⅝-inch chips obtained from red alder.

Cooking

Both the old- and the second-growth chips were digested according to the following cooking schedule:

Temperature-rise period.....1 hour to 160 C.
Time at maximum temperature..3 hours at 160 C.
Total time.....4 hours

Approximately 80 pounds of wood of each growth type were digested, from which the yield of fiberized pulp was about 77 per cent in each case. Two digestions were made of the second-growth Douglas-fir. The *p*H value of the spent liquors varied from 3.2 to 3.4.

Table 2—Pulp-test-sheet data on board stocks prepared from fiberized old- and second-growth Douglas-fir chips and from an admixture of these with red alder neutral sulphite semichemical pulp.

Furnish		Milling data			Sheet test data[2]			
Material	Amount	Run No.	Energy consumption[2]	Oliver freeness	Burst	Tear	Tensile	Density
	Percent		Hp.-days per ton	Sec.	Pts. per lb. per ream	Gm. per lb. per ream	Lb. per sq. in.	Gm. per cc.
Red alder semichemical	100	590	57	.....	0.48	1.34	1,403	0.25
Old-growth Douglas-fir	100	584	25	31	.02	.15	21	.30
Do.	100	585	38	65	.03	.35	109	.34
Old-growth Douglas-fir	80	584	31	44	.05	.54	256	.33
Red alder semichemical	20	590						
Old-growth Douglas-fir	70	584	35	56	.06	.59	273	.32
Red alder semichemical	30	590						
Steam-cooked old-growth Douglas-fir	100	586	12	40	.05	.53	128	.35
Do.	100	587	18	126	.10	.60	390	.38
Steam-cooked old-growth Douglas-fir	90	586	17	47	.08	.67	326	.36
Red alder semichemical	10	590						
Steam-cooked old-growth Douglas-fir	80	586	21	65	.10	1.00	443	.38
Red alder semichemical	20	590						
Second-growth Douglas-fir	100	605	23	36	.03	.36	91	.30
Do.	100	606	31	58	.05	.49	265	.32
Second-growth Douglas-fir	80	605	30	54	.04	.58	203	.30
Red alder semichemical	20	590						
Second-growth Douglas-fir	70	605	33	63	.07	.75	308	.30
Red alder semichemical	30	590						
Steam-cooked second-growth Douglas-fir	100	617[3]	16	30	.15	1.21	408	.31
Do.	100	618[3]	19	36	.20	2.06	735	.38
Steam-cooked second-growth Douglas-fir	80	618	27	48	.19	1.81	677	.35
Red alder semichemical	20	590						
Steam-cooked second-growth Douglas-fir	70	618	30	57	.21	1.96	858	.37
Red alder semichemical	30	590						

(1) Tests made on 340-pound ream-weight sheets (25 x 40—500 basis).
(2) Based on oven-dry material charged and an energy consumption of 85 per cent of the energy absorbed by the mill. B-957 plates were used, and the mill was run in the counterclockwise (brushing) direction.
(3) Stocks from mill runs Nos. 617 and 618 were dewatered over a wet machine, which resulted in a loss of fines. Preliminary Oliver-freeness tests on pit samples of these runs gave values of 33 and 53 seconds, respectively. In general, when loss of fines is not encountered, the pit-sample freeness determinations check with those run on the dewatered sample.

Approximately 60 pounds of red alder neutral sulphite pulp were prepared in the following manner:

Cooking schedule:
Steaming period.....½ hour
Impregnation period.....½ hour to 120 C.; ¾ hour at 120 C.
Blowback period.....¼ hour
Digestion period.....¼ hour to 160 C.; ¾ hour at 160 C.
Total time.....3 hours
Chemicals:
Sodium sulphite—11.2 pounds per 100-pound equivalent of moisture-free wood.
Sodium bicarbonate—8.0 pounds per 100-pound equivalent of moisture-free wood.

The yield of fiberized pulp obtained was 80.1 per cent.

Milling

The raw, the steam-cooked, and the semichemical-cooked chips were processed in a 36-inch attrition pulper, a double-rotating-disk refiner. The batches of raw or of steam-cooked chips processed in the mill varied from 28 to 81 pounds. The B-957 plates used were run in the counterclockwise or brushing direction. The raw second-growth Douglas-fir chips that contained 27 per cent moisture were milled at 0.010- and 0.005-inch plate clearances, which yielded a relatively coarse and a relatively fine stock, respectitvely. The old-growth raw wood that contained 34 per cent moisture was handled in a like manner, except that the larger chips required a relatively wide plate clearance and subsequent remilling. Two passes with a plate clearance of 0.020-inch were used for the production of a coarse stock, and two passes with plate clearances of 0.020 and 0.010 inch were used for the production of a finer stock.

One pass through the mill sufficed for both the old- and the second-growth Douglas-fir steam-cooked chips. Relatively coarse and fine stocks were obtained from both types of materials at plate clearances of 0.020 and 0.010 inch, respectively. One of the second-growth Douglas-fir digestions, No. 5317, was passed through the mill at 0.010- and 0.015-inch plate clearances.

In all of the stock preparations, the energy consumed in milling was recorded, and the Oliver freeness of the stocks was determined. In an attempt to expedite the work and to obtain pulp at a lower moisture content than generally attained, the second-growth Douglas-fir steam-cooked stocks, mill runs Nos. 617 and 618, were dewatered by means of a wet machine. A vacuum washer was used for dewatering in all other cases. With the wet machine an undue loss of fines occurred, and the resultant Oliver freenesses of the dewatered stocks were lower than those of the preliminary pit samples.

The red alder neutral-sulphite-semichemical-softened chips were milled and remilled at a 0.001- and a 0.002-inch plate clearance, respectively, to obtain a stock of 680-cubic-centimeter Schopper-Riegler freeness, a relatively slow stock for boards. The energy consumed in milling was recorded.

Board Making

For making ½-inch thick insulating board, a charge of pulp was dispersed in water by means of a motor-driven stirrer in a 30-gallon tank fitted with a 2-inch quick-opening valve. Sufficient water was added to bring the consistence to 1.3 per cent. The suspension was then adjusted to a *p*H of approximately 6.3 with a small amount of 10 per cent sulfuric acid. Three per cent of rosin size and 3 per cent of paper-makers' alum, on the basis of oven-dry fiber, were added. The *p*H value of the stocks ranged from 5.1 to 5.6. At this point, the agitation was discontinued and the stock was run into an 18-inch-square suction mold, 15 inches of vacuum were applied, and the free water was removed. The amount of stock in the charge was sufficient to produce a finished board with a density of about 20 pounds per cubic foot.

The wet mats, each approximately 1½ inches thick, were removed, placed on 16-mesh galvanized wire, and then pressed between sheet-metal cauls in a slow-acting hydraulic press at approximately 50 pounds per square inch. The springback thickness of the mats was approximately five-eighths inch.

The pressed mats were then dried in a 20- by 20-inch hot press. Stops were used in the press to obtain nominal ½-inch boards. The temperature of the platens was 180 C., and the time necessary to dry the mats was 1 hour or more.

Testing

Oliver Freeness—Freeness (a drainage-rate test) was determined for all unsized-board furnishes. To make this test, 150-gram batches of pulp, oven-dry basis, were charged to a 9½-inch-diameter Oliver leaf filter. In each case a volume of water was added to make up 14 quarts of stock. The free water was then removed from the dispersed stock under vacuum, and the time of drainage was recorded in seconds. The vacuum employed varied from 10 to 15 inches, depending on the setup on the vacuum pump employed, which in all cases was adjusted to give a 30-second drainage rate for water alone.

For control purposes, a less precise drainage rate was run in many cases on samples taken from the mill pit. This was done by forming a mat in the Oliver leaf filter under vacuum and weighing out 720 grams of the wet mat as a test sample. In general, these preliminary values were a good indication of the more exact freeness of the stock.

Pulp-sheet tests—The pulps for insulating-board purposes can be evaluated to a degree in the form of pulp sheets of 340-pound ream weight (25 x 40 — 500). Bursting, tearing, and tensile strengths, and density were determined according to TAPPI Standards. Pulps selected for testing were evaluated in this manner in most instances.

Insulating-board tests—In general, two insulating boards, sized with rosin, were made from each furnish selected for evaluation. One board furnished three specimens for transverse breaking load and three specimens for tensile strength. The other board furnished one water-absorption and one expansivity specimen, and two water-permeability test specimens. All tests, except transverse breaking load, were made according to Federal Specifications for Fiberboard: Insulating LLL-F-321b, Amendment 1, Dec. 17, 1942. The flexural-strength specimens were conditioned for 24 hours or more in a relative humidity of 65 per cent and at a temperature of 80 F., and were subjected to a rate of loading, during test, of 4 inches per minute.

Reference to the various classes of insulating board in this report is based on the classification in the Federal Standards.

Results

The data on the insulating boards made from the various stocks are given in Table 1.

In general, pulp-test-sheet data, as recorded in Table 2, indicated trends for the milling operations. For a given type of material an increase of energy consumption was reflected in an increase in sheet and board strengths. There was no correlation, however, between specific board strengths and specific sheet strengths prepared from different stocks. For instance, boards Nos. 711 and 761 (Table 1) had breaking loads of 16.0 and 12.8 pounds, respectively. The bursting strengths of the sheets made from the same stocks were 0.03 and 0.20 point per pound per ream, respectively.

A comparison of the freenesses of the stocks and of the resultant boards made from old- and from second-growth Douglas-fir and from an admixture of the same with red alder neutral sulphite semichemical pulp is given in Table 1. In most instances, the Oliver freenesses of the stocks tabulated were approximately 60 seconds or less and met the drainage requirement for conventional board machines. The transverse breaking load of these boards, in most cases, exceeded the 14-pound requirement of the Federal Standard for sheathing grade. The tensile strengths of these boards exceeded the requirement, and the linear-expansion values were below the maximum allowable for sheathing grade. The water-permeability values of these boards were in most instances below the minimum allowable time limit. The water-absorption requirement for building board was met in all cases.

In general, the quality of all Douglas-fir stock was enhanced by the addition of the red alder semichemical pulp. In most cases, it was possible to add as much as 30 per cent of the relatively strong neutral sulphite pulp to free and relatively weak Douglas-fir stocks without exceeding the Oliver-freeness limitation of approximately 60 seconds. Board No. 763, for example, made from a stock having an Oliver freeness of 57 seconds and containing 70 per cent fiberized, steam-cooked, second-growth Douglas-fir and 30 per cent red alder semichemical pulp, had a transverse breaking load of 24.9 pounds and a tensile strength of 490 pounds per square inch. In this case, the breaking load and the tensile strengths were 178 and 327 per cent, respectively, of the requirement for sheathing board.

The quality of the stocks prepared from the second-growth Douglas-fir was superior to those prepared from the old-growth Douglas-fir Good-quality stocks were prepared from raw old- and from second-growth wood and from steam-cooked second-growth wood. The steam-cooked old-growth stock, mill run No. 587, was far too slow to meet conventional board-machine drainage requirements. On the basis of the strengths of boards Nos. 715 and 716, which contained 10 and 20 per cent red alder semichemical pulp, respectively, the fiberized, steam-cooked, old-growth Douglas-fir would require approximately 15 per cent of the additive to make a sheathing-grade quality of stock.

Apart from quality, the ratios of strengths to the energy consumed in preparing the respective stocks, as shown in Table 1, are of interest. It appears from the data that in the preparation of boards of comparable strength, the milling-energy requirement for steam-cooked wood was about half that required for raw wood chips, irrespective of the type of Douglas-fir used. It is estimated from the data that the minimum energy requirement for the preparation of stock for making boards of sheathing-grade strength at a density of 20 pounds per cubic foot from raw and from steam-cooked chips would be as follows:

	Energy requirement in milling Hp.-days per ton
Raw old-growth Douglas-fir	35
Steam-cooked old-growth Douglas-fir	18
Raw second-growth Douglas-fir	28
Steam-cooked second-growth Douglas-fir	15

These values were obtained by dividing 14, the transverse-breaking-load value for sheathing-grade board, by the ratio of breaking load to energy consumption given in Table 1.

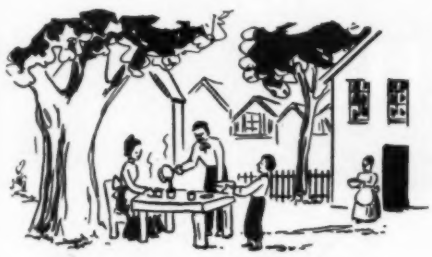
The incorporation of red alder in the various stocks did not improve the strength — energy-consumption ratio in most cases. Raw old-growth Douglas-fir stocks, however, were definitely enhanced in this manner.

✦ PAPER SKETCHES ✦

DISCARDED

New York telephone directories are used by one railroad in Central America to bullet-proof its cars. These books, packed between the car walls, stop bandits' bullets better than double-thick steel plates.

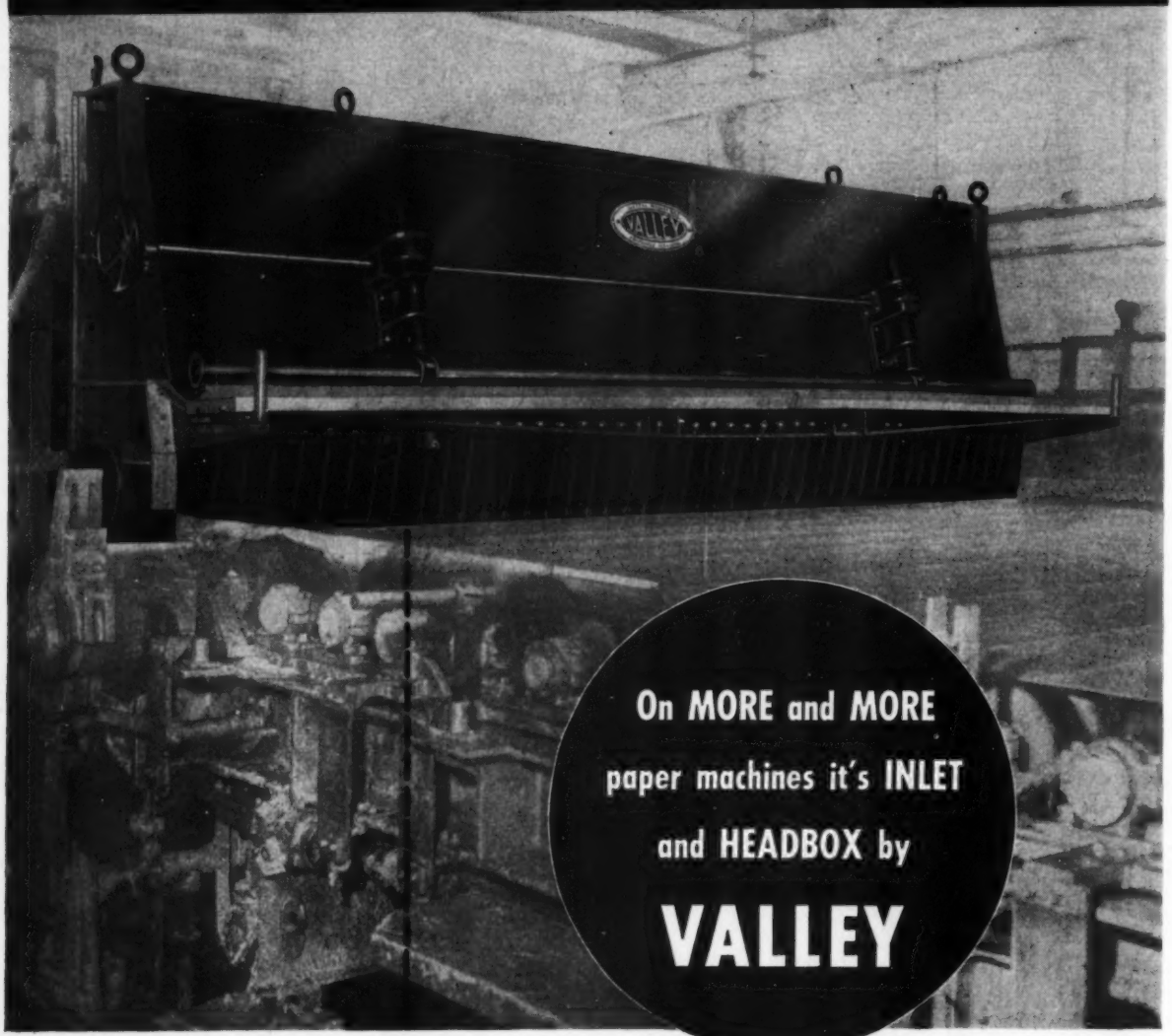
Before the days of the inch tape measure, London tailors (of the late 1790's) took approximate measurements of their client's dimensions on strips of brown paper or parchment.



PAPER CUPS capable of holding hot coffee, and costing a penny, were in popular use in Berlin, Germany, as early as 1863.

IN the late 1800's, waterproofed paper was used to build a church in Bergen, Norway, capable of seating 1000 persons.

This is Valley Stock Entrance Equipment on NO. 6 MACHINE* at Fraser Paper Limited, Madawaska, Maine



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Group of delegates at the TAPPI meeting on fibrous agricultural residues, held at Northern Regional Research Laboratory, Peoria, Ill.

Fibrous agricultural residues meeting of TAPPI

▶▶▶ The fall meeting of the Technical Association of the Pulp and Paper Industry on fibrous agricultural residues, held at the Northern Regional Research Laboratory, Peoria, Ill., November 13-14, brought out an enthusiastic attendance of 70 mill men, chemists, engineers, and equipment manufacturers.

The papers and talks presented covered a wide range of interest to the strawboard industry, and a feature of the program was the brevity of the papers which afforded active participation of members for questions and thorough discussion.

Eight papers and a roundtable discussion comprised the first day's technical program. After the usual self-introductions, *Dr. R. T. Milner,* director of the Laboratory, welcomed the group and described briefly some of the major research projects.

Starting off the technical session, *Ralph J. Anderson,* of Sisalkraft, gave the results of his company's experiments, starting as far back as 1937, with Sisalkraft for straw stack coverings. The cover material consists of two layers of 30-pound treated kraft paper reinforced with closely spaced, crossed sisal fibers, and is bonded together with asphalt under heat and pressure. For covering large ricks of baled straw, he said his company had made and tried Sisalkraft blankets up to 26 feet wide. The speaker recommended that before applying the cover a small overhang or "eave" should be made at the top edge to prevent drip

Prominent men who participated in the program

Dr. S. I. Aronovsky
Northern Regional
Research Laboratory

Dr. Reid T. Milner
Northern Regional
Research Laboratory

L. F. Herman
Gruendler Crusher
and Pulverizer Co.

L. W. Hesse
Keystone Steel and
Wire Co.

L. E. Eberhardt
Bauer Bros. Co.

R. A. Springer
Diamond Alkali Co.

M. L. Rankin
Taylor-Stiles & Co.

C. G. Krancher
Ball Bros. Co.

Sven Fahlgren
Bird Machine Co.

Ralph J. Anderson
Sisalkraft Co.

on the sides of the lower tiers. This is done by slight shifting outward of the top tier of bales. The next step is making a crown by spreading a layer of loose straw over the top, a strict precaution being to pack enough straw in the middle to prevent troughs formed by settling. It was recommended that the paper strips run lengthwise of the rick.

The discussion on "Why cut straw?" was led by *M. L. Rankin*, of Taylor, Stiles and Co., who said that cutting was cheaper than grinding. He listed the following advantages of cutting straw prior to cooking: (1) Digesters can be completely charged at one filling; less time is consumed in emptying the digester if straw is pre-cut; (2) cooking is more uniform; (3) necessity for large breaker beaters or other devices to chop and defiber the cooked straw is largely eliminated; and (4) time and labor per ton of pulp are reduced considerably. The speaker also showed how stock handling is simplified by the method, and more uniform pulp and paper result from pre-cut straw.

William H. Palm, of Hinde and Dauch Paper Co., of Canada, next described the layout of his company's mill at Trenton, Ont. The straw is prechopped with a Taylor-Stiles straw cutter and bale breaker. The problem of the moment is the lack of an efficient method for taking the chopped straw away from the unit as fast as it is cut. The cooked straw from ten rotaries falls onto an inclined floor leading to a canal which runs the full length of the digester building. From the canal the straw is hosed to a 9000-pound Tugboat equipped with washer drums. The stock from the Tugboat is bled off continuously to the refining system where it is mixed with paper stock. The corrugating paper is made on a 120-inch paper machine.

The problems of handling liquid caused. *L. E. Eberhardt*, of Bauer Bros. Co., of Diamond Alkali Co. He presented diagrams showing schematic plant layouts, placing particular emphasis on the facilities required for dilution of the liquid caustic, especially the 73 per cent solution. Proper types of equipment and practices of storage, insulation, and application of antifreeze measures were recommended.

The development of the Jonsson screen for paper stock was described by *Sven Fahlgren*, of Bird Machine Co. A recent use for this screen, he said, is for knotting kraft pulp ahead of the brown stock washers, with advantages of better black liquor recovery and maintainance of a high vacuum on the washers. The speaker also discussed the efficiency of the Jonsson screen for cleaning waste paper and de-inked stocks. The Bird vibrating rotary screen also came in for attention as applicable to certain problems in straw processing.

Two papers on refining were presented. *L. E. Eberhardt*, of Bauer Bros. Co. gave a preliminary report on disc refining of strawboard pulp. Experimental pulp made at the Northern Laboratory by mechano-chemical soda cooks was refined in commercial disc mills at the Springfield, Ohio, Fiber Products Laboratory. Acceptable pulps for corrugating were made on both single and double disc mills at high tonnage rates and relatively low horsepower-input per ton. The double disc mill proved more efficient than the single disc in reducing straw pulp to acceptable material in a one-pass operation.

A report on the operation of the Turbo pulp refiner was made by *Lester F. Herman*, Gruendler Crusher and Pulverizer Co., who presented data on experimental mechano-chemical straw pulp for corrugating, and on wood pulp. It was shown that stock hydrates to a high degree with a relatively low reduction of freeness. Classification studies of the refined pulp show a minimum, both of extremely coarse as well as of extremely fine material. Also, there was relatively little reduction in fiber length of pulp treated in the Turbo refiner.

In the final paper of the technical program, *C. G. Krancher*, of Ball Brothers Co., Noblesville, Ind., discussed the operation of the Hydraclone in cleaning up strawboard pulp. In a three-week period the removal of rejects averaged about 1¼ pounds per ton of pulp. More important, however, the use of this cleaning unit results in the manufacture of cleaner paper with fewer breaks in the press section of the paper machine, in greater production, in better felt life, and in lower maintenance costs on rubber press rolls.

As usual, the annual dinner was held during the evening of the first day. It was preceded late in the afternoon by a tour of the Pabst Brewing Co.'s Peoria plant, and followed by a social hour and banquet at Pabst hall. At the dinner, *Dr. S. I. Aronovsky*, chairman of the Fibrous Agricultural Residues Committee of TAPPI, introduced *R. G. Macdonald*, secretary-treasurer of TAPPI, who spoke on the TAPPI activities of the entire paper industry. *Dr. R. T. Milner*, director of the Northern Laboratory, introduced *L. W. Hesse*, community relations director of the Keystone Steel and Wire Co., Bartonville, Ill., whose subject was "What is today's steel situation?"

The second day's sessions covered reports on Committee activities, the results of co-operative experiments on straw preservation, and demonstrations of testing equipment. *Ralph E. Green*, Thwing-Albert Instrument Co., demonstrated his company's latest model laboratory corrugator, producing in a few minutes single-face and double-face board samples suitable for testing. *W. J. Delmhorst*, Delmhorst Instrument Co., displayed his improved portable apparatus for estimating moisture in baled straw.

Plans for 1951 were discussed. A meeting of the Committee will be held at the annual TAPPI convention in New York, February 19-22. The group decided that the major session of the 1951 fall meeting should be a roundtable discussion based on a questionnaire to be circulated among the strawboard mills. The site of the 1951 meeting was not definitely decided, but very likely it will be in the vicinity of a strawboard mill.

The 1950 meeting ended with two tours, one of the Northern Laboratory and the other of the plants of the Keystone Steel and Wire Co.

This year's fall meeting was the fourth held at the Northern Laboratory since 1944 when the Fibrous Agricultural Residues Committee was organized. The papers presented were quite interesting, and practically everyone present joined in the frank and lively discussions. The entire Laboratory staff, especially *Director Milner*, *Dr. E. C. Lathrop*, head of the Laboratory's Agricultural Residues Division, and Committee Chairman *S. I. Aronovsky*, in charge of the Division's pulp and paper section, assisted in every possible way with the Laboratory's facilities to make the meeting successful.

Lake States TAPPI Meets in Green Bay

On November 14, the Lake States Section of TAPPI met at Green Bay, Wis. Departing from the customary evening meeting, this section followed the practices of other groups and held an afternoon and evening meeting that featured a mill visit together with several technical papers.

With an attendance of over 200 technical men and mill executives, the meeting started with a tour of the new semichemical pulp and board mill of the Green Bay Paper and Pulp Co. This mill was described and illustrated in THE PAPER INDUSTRY for September, 1950.

The technical session and dinner was held at the Northland Hotel in Green Bay. Three papers on different aspects of semichemical pulping were given. Dr. K. W. Fries, Rhinelander Paper Co., discussed the use of semichemical pulp for glassine and similar products. Dr. W. W. Marteny, National Container Corp., Tomahawk, gave a description of the kraft semichemical process employed by his company. The final paper on the technical program was given by

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Superintendent: Since I put Hamilton Felts, top and bottom, on the rebuilt machine in building Number Four. Maybe Kennedy doesn't know it, but it is not the machine —it is the Hamilton Felts that put the smooth finish on both sides of the sheet.

President: Then why in heck don't you put Hamilton Felts on all our machines?

Superintendent: That is precisely what I am doing, sir. For every press of every paper or board machine there is a Hamilton Felt that will do the job better, faster, and at lower cost.

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Dr. S. R. Parsons, Consolidated Water Power and Paper Co., Wisconsin Rapids, who described in some detail experimental work at this mill in the bleaching of semichemical pulp for use in book paper.

Following the dinner, A. Newell Rumpf, Harris Trust and Savings Bank, Chicago, discussed paper mill financing, outlining various aspects involved in evaluating corporate financial problems of the pulp and paper industry.

Henry C. Crandall, Mosinee Paper Co., and chairman of the Lake States Section, presided at the different sections.

First Plans Released for Annual Meeting of CPPA and Technical Ass'n

The 1951 annual meeting of the Technical Section of the Canadian Pulp and Paper Association will be held at the Mount Royal Hotel in Montreal on January 24, 25 and 26. The program will cover all phases of pulp and paper manufacture, with subjects of interest to both management and operating personnel being included in the more than 26 papers scheduled for presentation.

Among the group discussions, arranged each year by the standing committees of the section, will be several round-table talks on each of the following: Alkaline Pulping, Board, Heat and Power, Mechanical Pulping, and Newsprint.

The Association has announced that non-members of the Technical Section are invited to participate in this conference. Requests for accommodations in Quebec should be addressed to R. H. Nash, general manager of the Mount Royal Hotel.

Officers Elected by ACS Div. of Cellulose Chemistry

In elections held recently by the American Chemical Society's Division of Cellulose Chemistry, Dr. Wayne A. Sisson, section head and rayon research chemist of American Viscose Corp., Marcus Hook, Pa., was chosen chairman of the group. He succeeds John S. Tinsley, Hercules Powder Co., Wilmington, Del., in the position.

At the same elections, Dr. J. L. McCarthy, associate professor in charge of pulp mills research at the University of Washington, was named vice chairman while Dr. W. E. Davis of Hercules Powder Co. was re-elected secretary-treasurer.

Coming Events

Jan. 9, 1951—Meeting of Metropolitan Section of TAPPI; subject will be "New ideas in the use of paper for automatic packing."

Jan. 15-18, 1951—Plant Maintenance Show and Conference, to be held at the Public Auditorium, Cleveland.

Jan. 24-26, 1951—Annual meeting of the Technical Section of CPPA, to be held at the Mt. Royal Hotel, Montreal, Can.

Feb. 6, 1951—The Pacific Coast Section of TAPPI will hold its annual engineering meeting at Olympia, Wash.

Feb. 19-23, 1951—Paper Week, annual meeting of the American Paper and Pulp Association and paper groups, at the Waldorf-Astoria Hotel, New York City.

Mar. 6, 1951—Meeting of Metropolitan Section of TAPPI: subject will be "Use of paper by business."

April 3, 1951—Meeting of Metropolitan Section of TAPPI; subject will be "Machinery innovations in the industry."

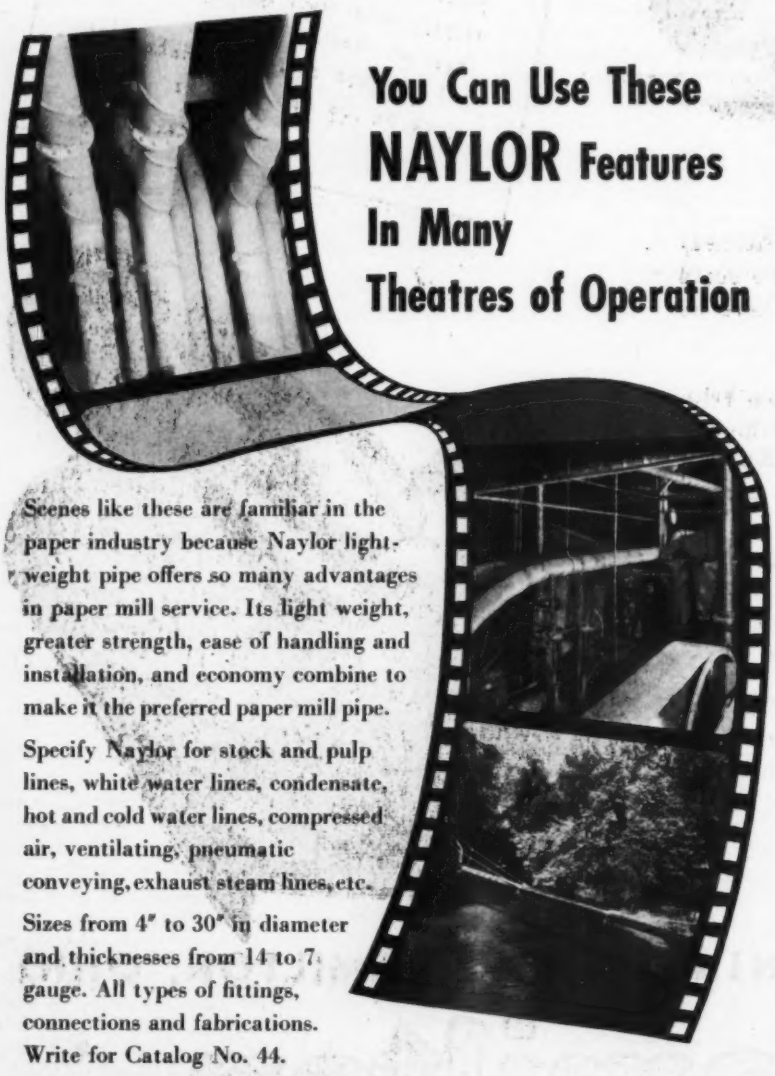
April 13, 1951—Annual meeting of Pacific Coast Section of TAPPI; featuring annual Shibley Award contest.

April 17-20, 1951—20th National Packaging Exposition of the American Management Association, in Atlantic City, N.J.

May 4-5, 1951—Spring meeting of the Northwestern Division of the Superintendents Association, to be held at the Radisson Hotel, Minneapolis, Minn.

June 7-9, 1951—Summer meeting of the Technical Section of CPPA, to be held at Bigwin Inn, Lake of Bays, Ont., Canada.

June 24-29, 1951—Annual meeting of the Superintendents Association, to be held at Multnomah Hotel, Portland, Ore.



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TAPPI alkaline pulping conference

Reported by
R. H. STEVENS

▶▶▶ THE PROGRAM OF the Alkaline Pulping Conference of the Technical Pulp and Paper Industry, held at Jacksonville, Florida, October 25-27, included a series of practical discussions on matters of concern to everyone involved in alkaline pulping. Robert Fuller, of Gulf States Paper Corp., arranged the program, and each of the discussions was led by someone with intimate experience on the subject. Over 200 persons were in attendance.

Symposium on causticization

Subjects discussed at this session dealt with preparation of white liquor, and included: green liquor clarification, causticizing sludge settling from white liquor, the effect on pulp properties of turbidity in white liquor, and the generation of hydrogen sulphide as a means for maintaining sulphidity.

J. M. Kahn, of Infilco, Inc., told of the effect of flocculation obtained by adding magnesium sulphate to green liquor in the clarifier. He cited notable reductions in iron—and in silica—content. During the discussion, mention was made of possible benefit of silica in preventing corrosion of digester walls.

Milton Roberts, of Hudson Pulp and Paper Co., Palatka, Florida, discussed the effect of "per cent causticity" on settling rate of white liquor. Efforts to increase yield of caustic will reach a point of "diminishing returns." This point may be displaced in the direction of higher yields by reducing the concentration, but then there is danger of having to use too great a volume of white liquor. It was generally agreed in the discussion that the white liquor volume in the digester charge should not exceed two-thirds the total liquor volume since presence of added black liquor favors the pulping reaction.

Harold Morris, of National Container Corp., told of the results of two pilot cooks—one made with average mill liquor and the other with a "synthetic" liquor prepared by absorbing dry hydrogen sulphide (bottled gas) in a solution of commercial (flake) caustic soda. The clearer liquor gave a softer pulp (lower permanganate number) which hydrated more readily attaining higher bursting and higher tearing strengths than did the more turbid liquor. Also, the activity of the black liquor from the cook made with the clearer liquor was the lower. It was suggested that suspended matter causing turbidity inhibits penetration of the liquor into the chips.

L. B. Taylor, of Columbia Chemical Div., Pittsburgh Plate Glass Co., described methods that could be used to generate hydrogen sulphide by reaction of elemental sulphur with alkalies at high temperatures. Absorption of the gas in white liquor would increase the sulphidity. Slides showing equipment used, reactions involved and yields at different temperatures etc. were exhibited. In the discussion it developed that various schemes for raising the sulphidity by adding elemental sulphur have been employed. These included dribbling it onto the chip conveyor belt, shoveling it into the digester, stirring it into the concentrated black liquor, adding it to the dissolving tank, and adding it to caustic soda liquor from electrolytic cells. It was suggested in the latter case that the sulphur might better be "burned" in the hydrogen evolved to yield hydrogen sulphide which then should be absorbed in the white liquor.

Lime burning symposium

At this session, devoted entirely to lime burning, S. A. Kiedl, of Allis-Chalmers Mfg. Co., led off with a description of lime reburning equipment. He was followed by B. Magee, of Traylor Engineering Co., who read a paper prepared by the late Ralph E. Gibbs, of York, Pa. Before this paper was read all stood for a moment in silence as an expression of respect for the memory of the deceased. It was extremely unfortunate that Mr. Gibbs could not present the paper himself. In reading it Mr. Magee brought out the fact that he was not in agreement with the ideas expressed in the paper and he could not, therefore, defend them in the panel discussion. Apparently many of those present were more favorably impressed with the ideas and data offered by Mr. Gibbs than by those of the other speakers. He favored a lower ratio of kiln length to diameter than did some of these and most of those with operating experience agreed with him.

A paper by Robert Bowen, North Carolina Pulp Co., on "The Bird Centrifuge for sludge washing and thickening" was read for him by Frank Brinkley. This paper gave operating data and showed that after suitable modification the Bird horizontal centrifuge had been able to wash lime sludge with a lower filtrate volume and deliver drier cake than is commonly attained on the conventional rotary filter.

R. S. Walker, Traylor Engineering Co., presented the ideas on lime kiln operation which are currently promulgated by his company. In the ensuing discussion some of the operators expressed ideas in strong disagreement with those advanced by the speakers. It was a lively discussion and the effect of retained soda, temperature of exit gases, volume-ratios etc. were bandied back and forth. Apparently no two lime kilns are operating exactly alike. If each operator would try all of the ideas suggested and then compare notes the resulting divergence of opinion would probably lead to confusion worse confounded.

Five papers at general session

At the third technical session, Henry Vranian, of The Chesapeake Corp. of Va., led off with presentation of "Pressure washing of kraft pulp." This described how the Sutherland-Valley Iron Works screw press has been improved and adapted to more flexible operation at higher efficiency both as to liquor dilution and power consumption.

W. F. Gillespie, of Gaylord Container Corp., gave results of a thorough investigation of the "Effect of wood storage on yield and quality." It included both laboratory studies on pilot cooks and results of cooking in mill digesters with machine production using this pulp compared with average normal production over a six-month period. The results showed that four months storage in the South reduces both yield and quality. Mr. Gillespie's style of delivery contributed much to the value of his subject matter. The discussion might well have been summed up in the words of a veteran pulp mill operator on a similar occasion in a superintendents' meeting who said "Grow the tree in the digester."

Dr. W. J. Nolan, of the University of Florida Engineering Experiment Station, described a method of "Cooking at constant temperature and constant concentration." He exhibited slides showing his equipment which consisted of seven "bomb tube" digesters encased in a shell to which steam was admitted. Cooking liquor was added under pressure to each digester at a rate designed to maintain constant concentration. In this way, a normal kraft cook could be completed in a quarter of an hour. Each digester was blown separately to a cyclone. This equipment was displayed to those who

visited the University laboratory on the last day of the meeting.

Session on water conservation

The final session was devoted to water conservation, effluent abatement, etc. A paper on "Re-use of water in kraft pulp and paper mills," prepared by A. E. Drew, of Southland Paper Mills, was read for him by Riston Dribble. The paper emphasized the necessity for making use of white water wherever possible. Kraft mills generally use from 15,000 to 30,000 gallons of fresh water per ton of pulp. The continually increasing drain on ground water supplies makes conservation imperative.

Dr. W. O. Hisey, a former faculty-member at the New York State College of Forestry, told of a 260 to 270 ton kraft mill of South Africa located in an arid region with no river for effluent disposal and only mine seepage water available for all purposes. Its location in a community of 100,000 population made the odor problem especially acute. An adaptation of the Tomlinson Oxidation tower permitted conversion of vile smelling sulphur compounds into forms which are reducible to sodium sulphide in the recovery furnace.

To illustrate efficiencies of the oxidizing tower, Dr. Hisey mentioned three typical ones:

	Case No.		
	1	2	3
Per cent Na_2S in smelt	14.0	18.7	25.5
Na_2S gm. per liter into tower	3.4	5.4	8.2
Oxidizing efficiency (per cent)	83	92	84

He said 83 per cent is the optimum practical value since further oxidation for 20 hours gave an increase of only 0.66 and another 48 hours gave only another 0.53, or a total of 1.19 grams per liter of Na_2S for 68 hours oxidation.

Dr. Hisey said the non-condensable gases were the chief source of the odor and 50-70 per cent of the gases released are sulphur compounds.

Of particular interest was the high conservation of water. Total mill effluent was only 1800 gpm, or 12,000 gals. per ton. This effluent had a B. O. D. (30-hr.) of 930 ppm. It goes to a spray pond from which cooling water for condensers is taken.

The wood used is 75 per cent hardwoods, principally eucalyptus, with 25 per cent of pine. Salt is electrolyzed and sulphur added to the caustic soda. The chlorine is used for bleaching and some added to stack gases.

A paper on "Wet strength resin usage," by R. E. Carter, of Reichold Chemicals, Inc., had been scheduled, but was not presented as Mr. Carter failed to arrive. This was a disappointment to several mill men who had come especially hoping to learn something about the technique of this new field of wet-strength resins.

The final paper by Allyn R. Skelton, of American Cyanamid Co., Mobile, Ala., on "Problems of white water re-use from standpoint of size, alum, and wax size utilization," dealt with the effect of various salts present in the furnish. He appeared to think excess of sulphate ions may affect wet-strength resins adversely.

Delegates visit University of Florida Laboratory

On Friday, the final day of the Conference, a planned field trip took the delegates to visit the pulp and paper laboratory of the University of Florida at Gainesville, and to Palatka to visit the plant of Hudson Pulp and Paper Co. Following these visits, the Noble & Wood Machine Co. was host at a party in nearby Welaka.

After the conclusion of the Conference, the Alkaline Pulping Committee met and decided not to attempt to present a program at the annual meeting in New York during Paper Week. Instead, another strong program for next fall was decided upon.

PANEL MEMBERS of Chicago TAPPI meeting on corrugated containers were (L to R): Art Sperling, plant engineer, Downing Box Co.; C. J. Zusi, vice pres., Container Laboratories, Inc.; S. F. Thune, sales mgr., Midwest Div. National Starch Products Co.; D. Santmyers, Indus. Product Dev. & Service Repr., Grasselli Div., E. I. du Pont; and F. D. Long, tech director, Container Corp. of America

Chicago TAPPI Meeting Is First Program Devoted to Corr. Container Field

The November meeting of the Chicago Section of TAPPI was held Monday evening, November 20. Following a short business meeting, the program was taken over by the panel moderator, F. D. Long, technical director, Container Corporation of America. Mr. Long remarked that this meeting was a red-letter meeting in the history of the Chicago Section since it was the *first* program devoted to the corrugated container field. National TAPPI has recognized that no national group has been specifically organized to cover this field, and, therefore, a corrugated container subcommittee has been set up. Mr. Long, who is chairman of this subcommittee, invited all members and guests present to participate in the activities of this committee, and suggested that the Chicago Section could spearhead work in this field by tailoring future programs to this subject. Approximately eight per cent of the corrugating machines in the country are concentrated in or near Chicago.

The panel members were introduced by the moderator, and S. F. Thune, sales manager, Midwest Division, National Starch Products, Inc., was the first speaker. Other speakers were: Art Sperling, plant engineer, Downing Box Co.; Don Santmyers, Industrial Products Development and Service representative for E. I. duPont de Nemours, Inc., Grasselli Division; and C. J. Zusi, vice pres., Container Laboratories, Inc. (*A short digest of these talks will be found in this issue. Cf. Convention Papers—Abridged, page 1002*)

Affiliate Reprs. Chosen by Two Divisions of Superintendents Ass'n

An announcement from the Superintendents Association reports that Walter B. Morehouse, Nopco Chemical Co., Inc., Harrison, N.J., last year's industrial affiliates representative for the Pennsylvania-New Jersey-Delaware Division of the Association, is to continue in the same capacity in 1950-51. Mr. Morehouse is also serving this year as second vice chairman of the Industrial Affiliates Committee of the national Superintendents.

The New York-Canadian Division of the Superintendents has chosen Gordon White, A. M. Staley Manufacturing Co., who may be contacted at 222 Kenwick Drive, Syracuse, N.Y., as its industrial affiliates representative.

GUEST AT THE FIFTEENTH Anniversary Meeting of the Ohio Section of the Technical Association of the Pulp and Paper Industry was the Association's national secretary, R. G. Macdonald (left), who spoke on the subject "What national TAPPI expects from the local Section." Next to Mr. Macdonald (at mike) is S. R. Olsen, a past chairman, and Vincent F. Waters, who served the Ohio Section from its organization in 1934 until 1938 as the first chairman

ON A RECENT TRIP to the British Isles and Scandinavian countries, Herbert T. Randall, vice president of the Champion Paper and Fibre Co., visited paper mills, laboratories, and machinery manufacturers. Following the dinner, he spoke informally on his travels. Left to right: P. S. Cade, Arthur Thurn, S. R. Olsen, and H. H. Latimer, all past chairmen; R. G. Macdonald, national secretary; Mr. Randall; Don Goodman, presiding chairman, and V. F. Waters, first chairman of the Section

Ohio TAPPI marks fifteenth anniversary

FIRST CHAIRMAN of the Section, Vincent F. Waters, spoke at the anniversary meeting

PRESIDING over the special ceremonies was Section Chairman, Don Goodman

▶▶▶ IN HONOR OF its past chairmen who contributed to the sound growth of the organization, the Ohio Section of TAPPI celebrated its fifteenth anniversary at the November 9 meeting held in Middletown at the Manchester Hotel.

Of the ten past chairmen, eight were present at the meeting. An attractive souvenir booklet detailing the history and activities of the Ohio Section was distributed to the members in attendance.

R. G. Macdonald, national secretary of TAPPI, was present at the meeting. Introduced by Don Goodman, present chairman of the Ohio Section, Mr. Macdonald briefly traced the history and events leading to the formation of the Ohio Section. He lauded the energy and enthusiasm shown by the Association and gave advice for successful and worthwhile meetings.

Following Mr. Macdonald's talk, fountain pen sets were presented to the past chairmen in appreciation for their faithful service to TAPPI. Vincent F. Waters, first chairman of the Ohio Section, made the presentations to the following past chairmen:

H. H. Latimer	1938-39
J. E. Burdsall	1940-41
Harry C. Fisher	1941-42
Carl D. Roess	1942-46
Samuel R. Olsen	1946-47
Phillip S. Cade	1948-49
Arthur Thurn	1949-50

Two other past chairmen receiving the tokens, but unable to attend the meeting, were: K. P. Geohegan, 1939-40; and D. M. Yost, 1947-48. A letter of regret that he could not attend the meeting was received from Mr. Geohegan and read at the meeting; he is a vice president of the national TAPPI. Messages of good will also were received from the Michigan and Lake Erie Sections of TAPPI.

Those present enjoyed an informal talk by H. T. Randall, vice president of The Champion Paper and Fibre Co. Mr. Randall gave a very interesting account of his recent trip to England, Scotland, and the Scandinavian countries. While there he visited 21 pulp and paper mills, 7 large laboratories, 3 machinery manufacturers, and 7 clay mines. The trip included over 5,000 miles of driving.

Officers Elected by Conveyor Equipment Manufacturers Ass'n

As the result of elections held at the seventeenth annual meeting of Conveyor Equipment Manufacturers Association held October 16 at White Sulphur Springs, W. Va., L. B. McKnight, vice president of Chain Belt Co., Milwaukee, was chosen president of the group. He succeeds John M. Alvey, president, Alvey Conveyor Manufacturing Co., St. Louis.

Other officers elected were G. W. Ostrand, general manager, Caldwell Plant, Link Belt Co., Chicago, vice president; Earl D. Stearns, general manager, Conveyor Division, Barber-Greene Co., Aurora, Ill., treasurer; and Lee Sekulski, sales manager, Mathews Conveyor Co., Ellwood City, Pa., secretary. R. C. Sollenberger was re-elected as executive vice president.

IN LINE FOR REGISTRATION at the Conference: (L to R) Dr. Arthur B. McLaren, prof. of polymer chemistry, Polytechnic Institute of Brooklyn; Dr. Raymond F. Boyer, director, Physical Research Lab., Dow Chemical Co.; Dr. David B. Hatcher, mgr. Industry Chemistry Div., Libby-Owens-Ford Glass Co. (Toledo); Richard T. Bingham, TAPPI representative; Dr. Edwin C. Jahn, TAPPI Plastics Committee and Conference chairman; Dr. Ralph T. Nazzaro, asst. prof. of Forest Chemistry, State University College of Forestry

A PAPER MILL EXECUTIVE and group of industrial researchers who attended the Conference: (L to R) Eli A. Haddad, research chemist, Monsanto Chemical Co. (Springfield, Mass.); M. E. Wendt, asst. mgr., Chemical Production Development Div., Goodyear Tire and Rubber Co., Akron; Ralph F. Nickerson, group leader, Research Dept., Monsanto (Everett, Mass.); A. L. Hatfield, research chemist, B. F. Goodrich Chemical Co., Cleveland; Dr. W. Allan Schenck, head of development group, Riegel Paper Corp., Milford, N.J.

TAPPI Paper-Plastics Conference

▶▶▶ SPONSORED by the Plastics Committee of the Technical Association of the Pulp and Paper Industry, a special conference held at the New York State College of Forestry, Syracuse, N.Y., October 19-20, 1950, was attended by 272 men. More than 200 of them were from industry with representation about equally divided between the paper industry and the plactics and resin industry. The remainder, about 65, were from educational and research institutions and governmental agencies. There was wide geographical representation with attendance from states as far distant as California, Louisiana, Georgia, Illinois, Michigan, Minnesota, Wisconsin, Maine, Indiana, Alabama, as well as from Ontario and Quebec, Canada.

The two-day conference was divided into four sessions. Each session was presided over by a chairman and a discussion leader was programmed for each. E. C. Jahn, TAPPI Plastics Committee, was Conference Chairman. Following are highlights from the papers given during the Conference:

I—Properties of plastics in relation to papermaking

Discussion Leader, A. D. McLaren, Polytechnic Institute of Brooklyn. (Dr. Herman Mark, who was scheduled to act as Leader, was delayed in reaching the meeting.)

1—"Adhesion fundamentals," by D. B. Hatcher, Plaskon Division, Libby-Owens-Ford Glass Co.

Dr. Hatcher reviewed the basic concepts for forming an adhesive bond and contrasted mechanical adhesion with specific adhesion. He divided types of bonds involved in specific adhesion into four classes: (1) electrostatic, (2) covalent, (3) metallic, and (4) residual bonding or diffusion forces. He emphasized the

GREETINGS EXTENDED to Dr. Herman Mark (left), internationally known scientist in plastics chemistry, Polytechnic Institute of Brooklyn, by C. E. Libby, professor of Pulp and Paper Manufacture, State University College of Forestry; D. M. Yost, director of research, Sorg Paper Co., Middletown, Ohio; Wm. H. Aiken, asst. mgr. of Chemical Division, Goodyear Tire and Rubber Co., Akron, Ohio

FOUR SPEAKERS on the program of the Cellulose Session: (L to R) Seated—Dr. Harold M. Spurlin, research chemist, Hercules Powder Co. (Wilmington); F. A. Simmonds, research chemist, U. S. Forest Products Laboratory, Madison, Wis.; Dr. Robt. H. MacClaren, research chemist, Eastman Kodak Co., Rochester, N.Y. Standing—Dr. Harold Tarkow, res. chemist, Forest Products Lab., Madison

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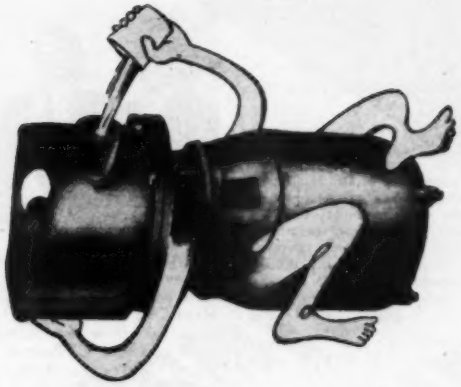

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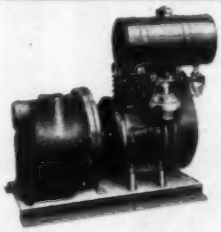

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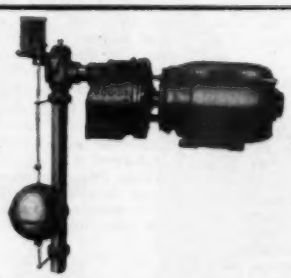

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importance of the treatment of the surfaces to be bonded as an aid in developing the fullest adhesion.

2—"Permeability of polymers to vapors," by A. D. McLaren, Polytechnic Institute of Brooklyn.

Dr. McLaren discussed the relations between the transmission of vapors and the chemical and physical character of the plastic film. With respect to water vapor transmission, Dr. McLaren stated that at low relative humidities the permeability of water vapor is proportional to the product of the diffusion constant and the solubility coefficient for vinyl polymers only (below 50 per cent relative humidity). Factors influencing water vapor transmission and gas vapors transmission through various types of films were discussed.

3—"Effect of plasticizers on physical properties of high polymers," by R. F. Boyer, Dow Chemical Co.

Dr. Boyer discussed the nature of solvent type plasticizers, that is, external plasticization. Compatibility, efficiency and permanence were discussed. Size and shape of the molecule influenced compatibility with polymers. Main emphasis was placed on efficiency of a plasticizer. Efficiency was described in terms of how much of a given plasticizer will lower the softening temperature or the second order transition point. Permanence depends on the effective volatility and the rate of diffusion of the plasticizer. There is a linear relationship between the logarithm of the diffusion rate of the polymer and the brittle point of a plasticized polymer. Compatibility, efficiency and permanence are all intimately related.

4—"New polymers and their possible application to paper," by Herman Mark, Polytechnic Institute of Brooklyn.

Professor Mark indicated the potential applications of fluorinated hydrocarbon polymers and also the use of bis-phenols as a means of modifying the rigidity of phenolic resins through internal plasticization. Condensation polymers of glycol and terephthalic acid offer interesting possibilities as a new fiber. Other current developments in the polymer field were mentioned by Dr. Mark including modified polybutadienes.

II—Beater addition fundamentals

Session Chairman, Professor C. E. Libby, head of Department of Pulp and Paper Manufacture, New York State College of Forestry.

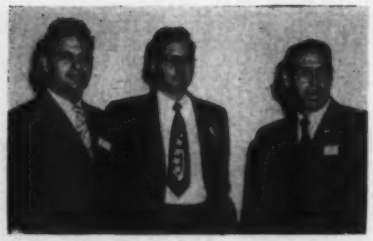
Discussion Leader, Allan Schenk, Riegel Paper Corp.

1—"The effect of latex variables in beater addition of nitrile latices," by D. M. Yost, Sorg Paper Co., and William H. Aiken, The Goodyear Tire and Rubber Co.

This paper was the first of two presented on the subject of nitrile latices. The paper was given by Mr. Aiken. Mr. Aiken pointed out that a number of nitrile rubber latex variables have been studied to determine their effect on beater impregnation, but that the work was limited to latices prepared with one basic polymerization system and to a medium beaten Scandinavian unbleached kraft pulp. Optimum properties were obtained with a rubber of medium acrylonitrile content and molecular weight with no additional stabilization after polymerization.

With alum as a coagulating agent optimum properties were obtained at a final $_pH$ range of 4.5 to 5.5. Somewhat better properties were obtained by coagulating with a 100-20 mixture of alum-sodium hydroxide at a final $_pH$ of 5.5 to 6.5. Coagulation with acids or acid-alum mixtures is to be avoided because it, as well as final $_pH$ values above 6.5, causes sticky sheets.

Although vulcanizing of the latex after coagulation appears to give a beneficial effect, this is offset by losses in properties brought about by the extra stabilizer that must be added along with the curing ingredients. Plasticizers improve drape and softness but decrease strength. Both stretch and edge tear are increased almost lineally with increased amount of latex while tearing strength progressively decreases. Bursting strength increased to a maximum while tensile tended to decrease.



CO-AUTHORS OF A PAPER given at one session were I. J. Gruntfest and V. J. Moser (left and 2nd from left), both of Rohm and Haas Co., Philadelphia. (Third author of the paper was from same company.) At extreme right is Roger C. Bascom, technical service mgr., Hycar and Rubber Chemicals Div., B. F. Goodrich Chemical Co., Cleveland

2—"The effect of certain papermaking variables in beater addition of nitrile latices," by D. M. Yost and William H. Aiken.

This paper was presented by Mr. Yost. Mr. Yost pointed out that the latex may be added to the pulp either before or after beating, but that it should not be coagulated until near the end of the beating processes. The amount of latex that could be incorporated in a beaten unbleached kraft pulp was greatly increased by reducing the pulp consistency. For latex contents up to 33 parts per 100 parts of pulp, better properties were obtained the higher the pulp consistency. For greater amounts of latex, better properties were obtained at lower pulp consistencies. Unbeaten bleached kraft pulps showed a greater tolerance for latex than unbeaten unbleached kraft pulps. However, beating bleached pulps did not increase their latex tolerance whereas the amount of latex that could be incorporated into unbleached kraft pulps was increased by beating.

Addition of latex increased the elongation and reduced the stiffness of all pulps tested. Effect on other properties depended to a great extent on the type of pulp used. The addition of latex showed little effect on drainage properties.

The stretch and tearing strength of latex-containing sheets relative to sheets not containing latex remained the same with variation in basic weight. Edge tear, bursting strength and tensile strength, on the other hand, showed relatively higher values at the higher basic weights.

The addition of resin size appeared to give no difficulties in latex-pulp systems. The addition of clay, however, reduced physical properties. It would appear that pulps may be dyed, but that best results are obtained when the color is added after the latex but before the alum.

The wet broke can be easily reworked with no appreciable reduction of properties. The dry broke on the other hand is hard to disperse and gives reduced properties. Mr. Yost pointed out that a mill run has been made with the latex developed in these studies, and that results obtained were in excellent correlation with the laboratory studies.

3—"Phenolic resins in paper modified by Acrylonitrile rubbers," by R. C. Bascom, B. F. Goodrich Chemical Co.

Mr. Bascom pointed out that phenolic resins are being used in nitrile rubbers as reinforcing resins to increase toughness and abrasion resistance and are used for such widely divergent applications as bonding automobile brake shoes to linings and bonding shoe soles to shoes. The introduction of nitrile rubber in conventional phenolic molding compositions causes pronounced changes in physical properties. Nitrile rubber phenolics withstand shock loads of from 1½ to 8 times greater than phenolics alone before first signs of failure and withstand shock loads of from 2-15 times greater than straight phenolics before complete failure. Mr. Bascom pointed out that the problem is to develop means of taking advantage of these desirous properties using methods and equipment available to the paper industry. He described laboratory experiments following techniques described by Snyder and his co-workers (April 1950, TAPPI). Pulp stock in the beater is added to an alkaline $_pH$ and the modified resin thoroughly dispersed with the roll lifted. The diluted phenolic resin is then run in at a point where maximum agitation is present. After a suitable dispersion time, the precipitating agent is added which will reduce the furnish to a point of 4.0-4.5. Incorporation of nitrile rubber results in improved flow and increased impact strength. This property is particularly important in the production of laminates in that such laminates may be cold punched without fracture. When high impact compounds are used the resin and rubber may be co-precipitated followed by dewatering, extruding and conditioning. When laminating papers saturated off the machine are molded, the resin flows away from the fibers resulting in a dense structure, and there is no evidence of flow of fibers or rupturing of the sheet.

4—"Applied studies of cationic urea formaldehyde wet strength resins," by I. J. Gruntfest, E. M. Young, Jr., and V. J. Moser, Rohm and Haas Co.

This paper was presented by I. J. Gruntfest. Mr. Gruntfest pointed out that cationic urea formaldehyde wet strength resins are now widely used in the paper industry. The known theory of the action of these resins, however, does not permit prediction of the time that the resin must be in contact with the stock in order to obtain optimum results. In the studies described by Mr. Gruntfest, a typical unbleached southern kraft furnish was used and it was found that even under the most severe stock dilutions and short contact times that there was no interference with the satisfactory performance of these cationic resins. The sulphate ion which has been found to reduce the effectiveness of the cationic melamine formaldehyde resins has no deleterious effect on the results obtained with the cationic urea resins.

(Turn to page 1002)

Waterproof Paper Mfrs. Elect Officers at Annual Meeting in Chicago

Election of officers was a feature of the annual meeting of The Waterproof Paper Manufacturers Association held at the Blackstone Hotel in Chicago, October 26. Charles G. Wood, president of Simplex Paper Corp., Adrian, Mich., was unanimously chosen president to succeed A. J. Thiel, Angier Corp., Framingham, Mass.

Mr. Wood's former position as vice president of the Association was filled with the election of George W. Chadwick, W. Ralson and Co., Inc., Old Bridge, N. J., to the post. Philip O. Deitsch, who has served as Administrative officer of the Association since its inception nine years ago, was unanimously reappointed to the post.

Nine men—H. A. Anderson, Sisalkraft Co., Chicago; S. A. Feely, Keystone Roofing Manufacturing Co., York, Pa.; S. E. Griffiths, Jr., National Waterproof Papers Inc., Camden, N. J.; J. D. Johnston, Union Bag and Paper Corp., New York; G. E. McCorison, Thilmany Pulp and Paper Co., Kaukauna, Wis.; A. J. Thiel, Angier Corp.; L. R. Watson, Tuggle Press Co., Appleton, Wis.; David E. Ryan, Edgewater Paper Co., Menasha, Wis.; and Fred Shepherd, The Ruberoid Co., New York City—were elected to the Association's board of directors.

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The Paper Industry Safety News

N.B. Ass'n and Safety Engineers Meet Together

The annual meeting of the Safety Engineers and Supervisors, sponsored by the New Brunswick Accident Prevention Association, was held in the Admiral Beatty Hotel, St. John, N.B., November 2nd and 3rd. Among the 60 delegates were representatives of New Brunswick International Paper Co. Ltd., Dalhousie, N.B.; Restigouche Co. Ltd., Campbellton, N.B.; St. John Sulphite Co., St. John, N.B.; Eastern Pulp Wood Co., Calais, Me.; and Bathurst Power and Paper Co. Ltd., Bathurst, N.B.

R. C. Patterson, secretary-manager of the Association, presided at all sessions. Speakers and their subjects included A. F. Blake, chairman of the Merit Rating Committee, N. B. Accident Prevention Association, "Merit Rating;" R. E. Crosby, personnel and safety supervisor, Canadian Cotton Ltd., Marysville, N.B., "The Safety Program at the Marysville Mill;" Mr. Kitteridge, personnel and safety supervisor, Eastern Pulp Wood Co., "Safety in the Woods"; Donald Kyle, first aid instructor, Canadian National Railways, Moncton, N.B., "First Aid and its Relation to the Safety Program;" J. P. Wadsworth, general safety supervisor of Canadian National Railway, Montreal, "Organizing for Safety at Home and at Work"; and G. H. Pearce, mill safety officer, Bathurst Power and Paper Co., "Selling the Safety Program."

September Scores Show 46 Perfect Records

THE PAPER INDUSTRY safety contest for 1950 is now in its last month. The last available scores—September scores—show that in September, the injury frequency rate of 10.96 for all reporters was higher for the third consecutive month and at the highest level in the 1950 contest. The rate was above 10.0 for the third consecutive month, too, and finally forced the cumulative rate above 10.0 for the first time in this contest.

The higher cumulative rate of 10.10 at the end of September was slightly higher than the rate of 10.06 for the corresponding period in the previous contest, and it was the first time in this contest that the rate was not better than the rate a year ago.

At the end of September, 46 contestants still had perfect records (list below). This was a decrease of five from the total of 51 at the end of August, but it was five more than the total of 41 at the end of September in the previous contest.

Division I—Pulp and Paper

GROUP A (None)

GROUP B (None)

GROUP C

West Virginia Pulp and Paper Co., Williamsburg, Pa.
Mead Corp. (Heald Div.), Cincinnati, Ohio.
Price Bros. & Co., Ltd., Jonquiere, P. Q., Canada.
Ruberoid Co., Erie, Pa.

GROUP D

Certain-teed Products Corp., E. St. Louis, Ill.
Certain-teed Products Corp., Port Wentworth, Ga.
Certain-teed Products Corp., York, Pa.
Certain-teed Products Corp., Richmond, Cal.
Philip Carey Co., Lennoxville, Que., Canada
U. S. Gypsum Co., Oakmont, Pa.
Armstrong Cork Co., Pensacola, Fla.
Pacific Coast Paper Mills of Washington, Inc., Bellingham, Wash.
Lloyd A. Fry Roofing Co., Brookville, Ind.
National Gypsum Co., Kalamazoo, Mich.
U. S. Gypsum Co., No. Kansas City, Mo.
Certain-teed Products Corp., Marseilles, Ill.
Mead Corp., Nashville, Tenn.
American Writing Paper Corp. (Nonotuck Div.), Holyoke, Mass.
Spaulding Fibre Co., Milton, N.H.
National Gypsum Co., Newburgh, N.Y.
Johns-Manville, Tilton, N.H.
Ruberoid Co., Dallas, Tex.
American Writing Paper Corp. (Mt. Tom Div.), Holyoke, Mass.
Kimberly-Clark Corp. of Canada, Kapuskasing, Canada.
Spaulding Fibre Co. (Hayes Plant), No. Rochester, N.H.

Division II—Paper Converting

GROUP A (None)

GROUP B

Canadian Cellucotton Products, Niagara Falls, Canada.
Container Corp. of America, Cleveland, Ohio.
Hankins Container Co., Elizabeth, N.J.

GROUP C

Bird and Son, Inc., Chicago, Ill.
Kimberly-Clark Corp., Appleton, Wis.
Marinette Paper Co., So. Glen Falls, N.Y.
St. Regis Paper Co., Nazareth, Pa.
Lily Tulip Cup Corp., Chicago, Ill.
Thilmany Pulp and Paper Co., Kaukauna, Wis.
Certain-teed Products Corp., Dallas, Tex.
St. Regis Paper Co., Ltd., Dryden, Ontario.
Certain-teed Products Corp., Kansas City, Mo.
Container Corp. of America, Greensboro, N.C.
Lily Tulip Cup Corp., Galva, Ill.
Pillsbury Mills, Inc., Wellsburg, W. Va.
Container Corp. of America, Philadelphia, Pa.
Certain-teed Products Corp., Buffalo, N.Y.
Lily Tulip Cup Corp., French Lick, Ind.
Bay West Paper Co., Green Bay, Wis.
Flintkote Co., Hollywood, Cal.
Lloyd A. Fry Roofing Co., San Leandro, Cal.
Lloyd A. Fry Roofing Co., Minneapolis, Minn.

The Paper Industry Names in the News

Frank H. Wheelock

Harvey M. Brown

Fibreboard Promotions—Harvey M. Brown Retiring

The retirement of Harvey M. Brown, resident manager of the Vernon (Calif.) Division of Fibreboard Products, Inc., San Francisco, has resulted in the promotion of two other company executives. The former assistant resident manager, Frank H. Wheelock, became resident manager; Bruce F. Brown, Jr., former chief chemist, was named assistant resident manager.

Early in his career Mr. Brown became associated with Southern Board and Paper Mills, Los Angeles, and served that firm as secretary-treasurer until its 1917 acquisition by Paraffine Cos. Mr. Brown's association with Fibreboard began in 1927 when one of his affiliations, Crescent Board Mills, became the Port Angeles Division of the company; he became resident manager of the Vernon Division that year.

Mr. Wheelock joined Fibreboard as a sales order clerk in 1930 after university study. After transferring to the estimating department, and later to the laboratory, he became board mill manager in 1942.

After his university graduation in 1936 Bruce F. Brown, Jr., joined Fibreboard. Advancing from mill work to the purchasing, estimating and accounting departments, he became assistant chemist in 1939 and chief chemist in 1942.

J. H. Heuer Leaves St. Regis—Now Gen. Mgr. A.P.W. Products

The resignation of John H. (Pete) Heuer as technical director of the printing, publication, and converting paper division of St. Regis Paper Co., Watertown, N.Y., became effective early this month.

Associated with the Regis company for the past three years, Mr. Heuer terminated that connection to become general manager of the A.P.W. Products Co., Inc., Albany, N.Y. St. Regis has as yet chosen no one to succeed him.

Suellau Advanced to Sales Director of Gen. Chemical Div.

The post of director of sales for General Chemical Division, Allied Chemical & Dye Corp., New York, recently left vacant with the election of Chester M. Brown to a company vice presidency, has been filled with the appointment of Vincent W. Suellau to the position.

A member of the General Chemical sales organization for the past 30 years, Mr. Suellau has been a heavy chemical sales manager since 1944. Before that appointment he had served as manager of general sales offices in New York, Buffalo, Cleveland, Chicago, St. Louis, Los Angeles and San Francisco.

Bruce F. Brown, Jr.

John Birrell

John Birrell Is now with Morningstar, Nicol

With headquarters in New York, John Birrell has joined Morningstar, Nicol, Inc., New York, in a technical sales capacity.

Mr Birrell was formerly associated with Stein Hall & Co., New York, where he had been associated for the past 25 years. Beginning his association with the Stein firm as an office boy, Mr. Birrell gradually increased his status to that of a member of the laboratory staff. As a member of Stein's technical service department he pioneered in the development of the S. H. corrugating adhesive process, becoming manager of that department. When he terminated his association he was manager of the adhesive sales department.

V. W. Suellau

Milton G. Peck

Milton Peck Made Sales Mgr. of Clark Equipment Co.

An announcement from Clark Equipment Co., Battle Creek, Mich., reports that Milton G. Peck has been appointed sales manager for the recently introduced line of Clark powered hand trucks.

Mr. Peck is widely known in the field of materials handling equipment for his work as sales manager of the Industrial Truck Division of Yale and Towne Manufacturing Co., Philadelphia, Pa.

Frederic C. Clark in New Field—Will Retain Some Paper Mill Clients

Although Frederic C. Clark, president of Frederic C. Clark Associates and past national president of the Technical Association of the Pulp and Paper Industry, will continue to serve as a consultant to several of his former clients, he will in the future devote the greater part of his time to a new enterprise—as yet undisclosed—which is unrelated to the pulp or paper industries.

To further his new interests, Mr. Clark has moved his offices from 141 East 44 Street, New York, to Manchester, Vt.

Paul Lacy Retires from Westvaco, Covington—E. C. Williams, Jr., Succeeds

The manager of the Covington, Va., plant of West Virginia Pulp and Paper Co., New York, Paul B. Lacy, will relinquish his attive duties with the firm on January 1. He will remain with the firm as special consultant for long-range planning.

Mr. Lacy's association with West Virginia began immediately after his

1911 graduation from Pennsylvania State College. His career with the company showed a steadily increasing responsibility; made supervisor of acid works and digesters in 1917, he became superintendent of the sulphite mill in 1920, and superintendent of pulp and paper production in 1925. In 1930, he became assistant manager, and in 1941 he was made manager and elected to the board of directors.

Succeeding Mr. Lacy as manager will be E. Crawley Williams, Jr., who has been assistant manager in charge of production at the Covington plant. Mr. Williams joined the firm in 1934 upon his graduation from Virginia Polytechnic Institute. Beginning as a paper tester in the paper control laboratory, he later became general superintendent of the steam power, electrical and paper mill departments. He attained the assistant general managership in 1949.

Howard Palmer now Gen. Sales Mgr. of Lewis-Shepard

The former director of sales for Lewis-Shepard power division of Lewis-Shepard Products, Inc., Watertown, Mass., Howard M. Palmer, has been appointed general sales manager of the company.

Assistant materials superintendent in charge of materials handling at Bethlehem Hingham Shipyard during World War II, Mr. Palmer earlier was New England district sales manager for General Fireproofing Co.

Howard M. Palmer

F. E. Hutton

Frank E. Hutton Promoted by Babcock & Wilcox—Now Executive Assistant

Culminating some 23 years of service with Babcock & Wilcox Co., New York, Frank E. Hutton has been appointed executive assistant of the firm. He will be in charge of application and sales of heat and chemical recovery equipment, digesters, alloy castings, and other process equipment for the pulp and paper industry; additionally, Mr. Hutton will direct sales of process equipment and alloy castings generally, and of pulverizers for cement, metallurgical and special applications.

A graduate of Washington University, Mr. Hutton joined B&W in 1927 as an apprentice engineer. After general experience and training in the company's Barberton, Ohio, and Bayonne, N.J., shops, he became a member of the Pittsburgh sales staff. After government service during World War II, he joined the New York office five years ago.

Morse Chain Elects Two New Board Members—Hawley Re-elected Pres.

As a result of a board meeting of Morse Chain Co., Chicago, a division of Borg-Warner Corp., F. M. Hawley was re-elected president and general manager of the firm, and six officers were newly elected.

J. N. Candler, formerly administrative assistant to Mr. Hawley, was appointed vice president and assistant general manager; R. J. Howison, formerly general sales manager, was named vice president in charge of sales; E. W. Deck, formerly manager of the Ithaca plant, was named vice president in charge of manufacturing at Ithaca; M. V. Durkin, former manager of the Detroit plant, was chosen vice president in charge of manufacturing of that plant. While V. P. Burgess was re-appointed assistant secretary, W. M. Reynolds was named secretary and treasurer and E. G. Wuensch was named assistant treasurer.

New Officers Elected by Worthington-Gamon Meter

Election of officers of Worthington-Gamon Meter Co., Newark, N.J., was accomplished recently. The firm's former president, Charles E. Wilson, was elected chairman of the board. The presidency was assumed by Robert R. Anderson, and William C. Flanders was chosen vice president in charge of sales. Newly elected as secretary-treasurer is Walter H. Zeis. This company is a subsidiary of Worthington Pump and Machinery Corp., Harrison, N. J.

Mr. Wilson, who has served as subsidiary president since 1946, will continue as vice president of the parent company; in that capacity he directs sales activities of the Vertical Turbine Pump and Construction Equipment Divisions.

Associated with Worthington-Gamon since 1922, Mr. Anderson was elected treasurer of the firm in 1932, and vice president in 1942. Mr. Wilson has been with Gamon since 1925, becoming sales manager of the firm in 1937. Mr. Zeis,

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and a

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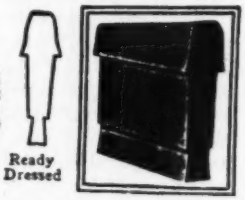

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H. WATERBURY & SONS CO.

ORISKANY, N. Y.

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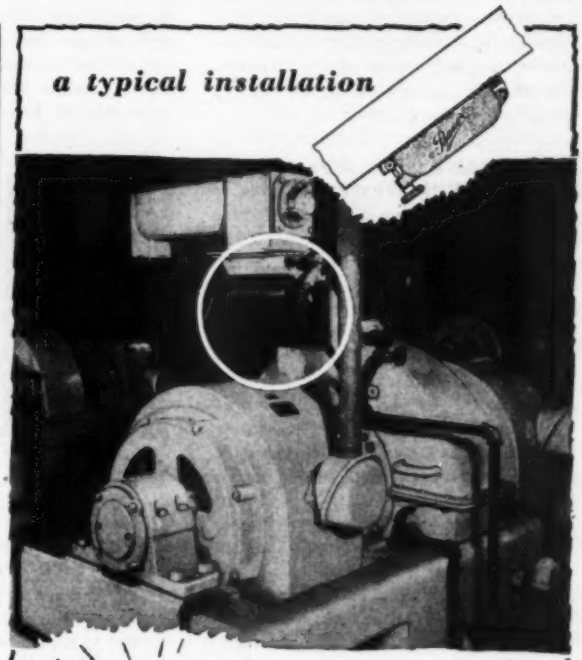


Bauer **magnetic separators protect machinery and product**

The photograph shows a Bauer Triple-Air-Gap Permanent Magnetic Separator installed in the chute which feeds chips to a Bauer Pulp Refiner. Obviously, the purpose of the separator is to catch tramp iron and steel.

In removing a single large ferrous object during a whole lifetime of service, a Bauer Magnetic Separator can pay for itself by averting damage to an expensive machine. Less spectacular, Bauer Separators save the product from contamination by attracting the smallest ferrous particles.

In addition to the magnetic separator shown here, the Bauer line includes three other models. All are illustrated and described in Bulletin M-3-A which also explains the superior performance of Bauer Separators in the steel ball test. This is highly interesting and important.

Since you associate our company with Bauer Pulp Refiners and Bauer-McNett Classifiers, you may be surprised to know that we pioneered the use of Alnico in permanent magnetic separators 13 years ago. The Triple-Air-Gap design is a patented Bauer feature. Other magnetic separator accomplishments include the new Bauer magnetic grate.

So you'll want our bulletin on Permanent Magnetic Separators. Be sure to ask for a copy. Write, phone, or wire.

THE BAUER BROS. CO.

1759 Sheridan Ave., Springfield, Ohio

who joined Worthington in 1925, served the parent company in increasingly demanding accounting positions until his election as treasurer of the subsidiary firm in 1948.

Theo. Cook Retires After 40 Years With Westvaco

After 40 years service to West Virginia Pulp and Paper Co., New York, Theo. A. Cook, resident manager of the Charleston, S.C., mill and a member of the board of directors, retired from active duty on December 1st.

Mr. Cook began his career with West Virginia in 1910 when he became a chemist in the Tyrone, Pa., mill. It was while he was assigned to the Tyrone laboratory that he earned the nickname of "Doc" by which he has been known for a quarter of a century, by acting as the mill's first-aid man.

Advanced to the position of assistant superintendent of the Tyrone mill in 1920, Mr. Cook became superintendent in 1927. During this time, Mr. Cook supervised the rebuilding and modernization of the pulp mill and earned a reputation as a technical authority in that field.

When West Virginia built a new kraft pulp and paper mill at Charleston in 1936, Mr. Cook was named manager of the new mill. Beginning his management of the Charleston operations during the mill's construction, Mr. Cook has directed its activities since it began operations in July, 1937.

Thomas A. Cook

Richard H. DeMott

DeMott Succeeds Batt as SKF Vice President

The new president of SKF Industries, Inc., New York, is Richard H. DeMott, former vice president in charge of sales for the firm. He succeeds William L. Batt, wartime production expert, who formally resigned presidency of SKF to re-enter government service as chief of the Economic Co-operation Administration mission to the United Kingdom.

Mr. DeMott, who has pioneered the use of antifriction bearings in the papermaking industry, joined SKF in 1915. A year later he was made district manager of the firm's New York office, and set up the company's industrial development department in 1921. After acting as assistant sales manager from 1923 until 1928, and as general sales manager until 1942, Mr. DeMott became vice president in charge of sales in 1943.

Marsteller Leaves Rockwell To Conduct Adv.-Consultant Business in Chicago

So that he may establish a new marketing and advertising consultant service to be known as The Marsteller Co., William A. Marsteller has resigned as vice president of Rockwell Manufacturing Co., Pittsburgh, and as director of Edward Valves, Inc., East Chicago, Ind.

Mr. Marsteller, whose new firm will be located at 612 No. Michigan Ave., Chicago, after the first of the year, has been responsible for advertising, market research and sales promotion for the Rockwell firm and its 15 divisions. Recently serving Edward Valves in an executive advisory capacity, he was formerly in charge of that company's sales, advertising and employee relations.

Two Sales Promotions at Hooker

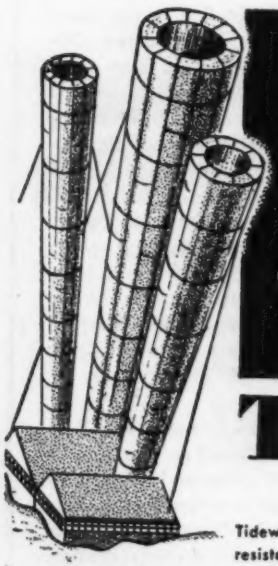
Two executive promotions have been effected by Hooker Electrochemical Co., Niagara Falls, N.Y. John S. Coey, associated with the firm since 1937, has been appointed eastern sales manager of the firm. Mr. Coey, who has since 1943 been manager of sales development, will be responsible for the sales of Hooker chemicals manufactured at Niagara Falls.

The former eastern sales supervisor, Thomas H. Trimble, has been named assistant manager of the Niagara sales office. Mr. Trimble, associated with Hooker since 1934, had held his former post since 1949.

W. L. Jennings Elected Vice Pres. of Westvaco

At a meeting of the board of directors of West Virginia Pulp and Paper Co., New York, Wiley Leroy Jennings was elected vice president and director of the firm. Mr. Jennings, company sales manager, fills the vacancy on the board left by the recent death of Sidney M. Phelan, Jr., late senior vice president and director. (See Necrology)

After working for West Virginia Pulp



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between academic sessions at Virginia Polytechnic Institute, Mr. Jennings joined the firm permanently upon his 1934 graduation from Polytechnic. Originally a paper tester in the Covington mill, Mr. Jennings was superintendent of that mill when he was made superintendent of the New York office in 1945.

E. C. Atkins Co. Elects Two New Officials

At the annual stockholder's meeting of E. C. Atkins and Co., Indianapolis, held recently, all present officers of the company were re-elected and two new officials were chosen. O. F. Heslar is now executive vice president, and J. C. Martin is assistant secretary-treasurer.

Mr. Heslar, a retired Naval Captain, came to the company after serving as director of public works and supply for the State of Indiana. Mr. Martin, who has been assoaciated with Atkins for 40 years, will continue in his earlier capacity as credit manager.

Two Men at American Brake Shoe Are Made Vice Presidents

Two new executive appointments have been made by American Brake Shoe Co., New York. The former assistant vice president of the Brake Shoe and Castings and Southern Wheel Divisions of the firm, Ralph L. Robinson, has been made vice president of those divisions. Mr. Robinson will make his offices at 109 No. Wabash Ave., Chicago.

The former Pacific Coast Division district sales manager, Edward R. Anderson, will remain in San Francisco, where he will now serve as vice president of the Brake Shoe and Castings Division.

James Davis, formerly woodlands manager for Gould Paper Co., Lyons Falls, N.Y., a subsidiary of Continental Can Co., has resigned his position with Gould to become general manager of Swift River Lumber Co., Conway, N.H. Mr. Davis has acquired stock in the Swift River firm, and will have charge of the sawmill and woods operation of the company.

Walter F. Garlow has resigned as advertising manager of Hewitt Rubber Division and Hewitt Restfoam Division of Hewitt-Robins Inc., Buffalo, N.Y., to accept an appointment as sales promotion manager of The Howe Scale Co., Rutland, Vt. Mr. Garlow's earlier associations included administrative assistantships for Bell Aircraft Corp. and Manufacturing and Tool Corp.

F. L. Wurzburg, Jr., until recently head of the International Printing Ink, New York, precision color laboratories, has assumed new responsibilities with International Printing Ink Division of Interchemical Corp. As one of the best equipped colorimetrists and color control technicians in the field, Mr. Wurzburg will head all IPI activities in setting up color standards and color uniformity controls for IPI customers. His offices will be at 636 Eleventh Ave., New York.

James J. Filas, formerly special representative in charge of stitching machine activities in the Central Division of Acme Steel Co., Chicago, has been appointed manager of the company's newly-created fastener department. The new department will be responsible for development of manufactured steel specialty items for fastening and tacking.

Frank W. Thornhill has been appointed vice president of Hudson Paper Co., Vancouver, B.C.

Ervin J. Bookout, former Eastern sales manager for Cochrane Corp., Philadelphia, has been appointed general sales manager of the firm. Previous to his appointment to the Eastern sales department, Mr. Bookout served the company as sales engineer in the Philadelphia territory.

B. C. Blake, formerly works manager of Connors Steel Co., Division of H. K. Porter Co., Inc., Birmingham, Ala., has been appointed vice president and general manager of the Division. In his new position Mr. Blake, whose association with Connors began in 1929, will make Birmingham his headquarters.

S. H. Popovich, a 1950 graduate of New York State College of Forestry, has been made director of quality control for W. C. Hamilton & Sons, Miquon, Pa.; *W. O. Kincannon, Jr.,* a 1950 graduate of Massachusetts Institute of Technology, has joined the firm's technical staff.

The Paper Industry Necrology

A. Fred Crossman

Widely-known president of The Lindsay Wire Weaving Co., Cleveland, A. Fred Crossman, passed away November 4, at the age of 59.

A. Fred Crossman

Having joined the Lindsay organization in May, 1920, Mr. Crossman soon proved himself an able executive. When the firm's founder, Hamilton Lindsay, passed away in 1932, Mr. Crossman was elected company president.

Homer B. McCormick, superintendent of pulp preparation and stores for Scott Paper Co. at Chester, Pa., passed away November 14 at the age of 56. Mr. McCormick, who joined the Scott firm fifteen years ago, is survived by the widow and one son.

Walter H. Hermann, president of The Hermann Manufacturing Co., Lancaster, Ohio, passed away November 8.

Sidney M. Phelan, Jr.

A director and senior vice president of West Virginia Pulp and Paper Co., New York, Sidney M. Phelan, Jr., passed away November 8 at the age of 64.

Joining West Virginia in 1927 as head of board sales, Mr. Phelan was named vice president in charge of sales in 1940 and became a member of the board in 1945. In 1948 he was named first vice president, a title recently changed to that of senior vice president.

A Phi Beta Kappa graduate of Yale University, Mr. Phelan was active on the executive committees of the Kraft Paper Association, the National Paper Board Association and the Fourdrinier Kraft Board Institute.

The widow and two children survive.

Harry S. Lewis, owner of J. P. Lewis Co., Beaver Falls, N.Y., and treasurer of Latex Fibre Industries, Inc., passed away October 19.

Julius H. Toole, at one time superintendent of an American Writing Paper Corp. mill at Holyoke, Mass., passed away October 26 at the age of 62. A sister and brother survive.

THE LEWELLEN AUTOMATIC CALIPER CONTROL

for paper board mills

OVER 100 MODERN PAPER MILLS DEPEND ON THIS LEWELLEN CONTROL TO MAINTAIN UNIFORM CALIPER. Here's what happens: Reduces caliper variations to a minimum . . . Completely automatic . . . requires no attention after caliper has been set for desired thickness. In a few seconds, controls may be reset when changeover is made for a new caliper setting . . . When changing from a light to a heavy caliper, or the reverse, the machine tender can make approximate gate adjustments instantly by a simple, quick turn of hand-wheel on stock box. The Lewellen Controls then make final adjustments to bring sheet to caliper setting.

This Lewellen Automatic Caliper is the heart of the Lewellen Automatic Thickness Control. It operates successfully on board thicknesses of from .010" to 1.375" . . . By the makers of the famous Lewellen Variable-Speed Transmission and Variable-Speed Motor Pulley.

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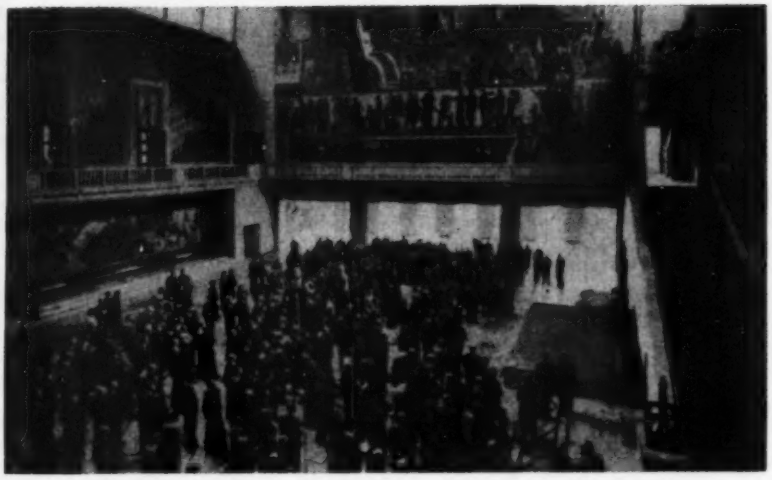


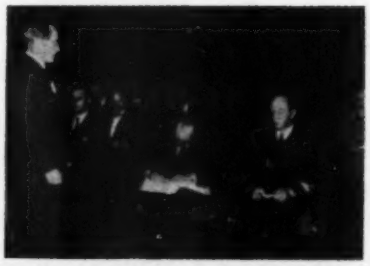
Norse pulp and paper engineers inspecting new city hall at Oslo

Pulp and Paper Engineers at Oslo Congress of the Nordic . . . .

▶▶▶ Some 450 technical men from Denmark, Finland, Norway, and Sweden gathered in a Congress that was held in June at Oslo, Norway. Various visits to neighboring pulp, paper, and wallboard mills were a feature of the gathering, and the convention was opened formally in the University Concert Hall, by the Norwegian Minister of Industry, Lars Evensen.

H. R. H. Crown Prince Olav was in attendance, and Knud Somme, chairman of the Norwegian association, welcomed his colleagues from other Scandinavian countries, who represented the sister organizations in Finland, Denmark and Sweden. The visitors presented the Norwegian engineers with a handsome guest book, which the Crown Prince was the first to sign. The town of Oslo treated the Congress as a festive occasion, and gave the delegates a luncheon at the new and highly modern City Hall. Brynjulf Bull (Vice-Chairman of the City Council of Oslo) welcomed the engineers. The new city hall has been decorated by a number of eminent Norwegian mural painters.

Technical papers were read on two days of the Congress. These articles will eventually be published in *Norsk Skogindustri*, the official organ of the Norwegian Papermakers Association, Chemical Wood Pulp Association, Mechanical Wood Pulp Association, Timber-Trade Association, Wallboard Manufacturers Association, Pulp and Paper Engineers, and of the Norwegian Pulp and Paper Research Institute. *Norsk Skogind* 4, 177 and 230-236 (1950).



H. R. H. Prince Olav of Norway signing guest book of The Nordic Pulp and Paper Engineers (Oslo, 1950)

Paper Mills Planned for Jamaica

Jamaica should have a paper industry by the end of 1950 if present plans continue satisfactorily. Two factories are planned, the main one at Port Antonio on the north shore and a subsidiary one at Black River on the south coast of the island.

Foreign and local interests plan to invest £250,000 in the project, which will provide considerable employment and will save the island thousands of dollars of foreign exchange usually needed to purchase paper from hard-currency countries.

At first the main production of the factories will be paper bags and wrapping paper. The cement, phosphate and sugar industries are important users of paper bags, and these alone should provide a basic profitable outlet for the industry.

The two major sources of pulp will be banana trash and wild cane. Other sources of fibrous materials include sisal waste, corota weed, which grows wild in many parts of Jamaica, and waste paper. (From *Foreign Commerce Weekly*)

Drupa Exhibit Closing Date Announced

Exhibitors' applications for participation in DRUPA—International Exhibition Printing and Paper Düsseldorf—may not be submitted after December 31, 1950. Extensions of this date are unlikely, in view of the great demand for space already shown by interested companies.

Applications for space at the meeting, to be held at Düsseldorf, Germany, from May 26 to June 10, 1951, should be sent to Nordwestdeutsche Ausstellungs Gesellschaft m.b. H., Düsseldorf, Ehrenhof 4, Germany.

Caustic Soda and Chlorine Plant Built in India by H. K. Ferguson Co.

A new caustic soda and chlorine plant, constructed by American engineers, has increased the production capacity of caustic soda in India almost 20 per cent.

The plant, now operating at capacity, was designed and built by The H. K. Ferguson Co., Cleveland industrial engineers and builders, for Delhi Cloth and General Mills, Ltd., at Delhi. Financed entirely by Indian interests, it is the only plant in northern India which produces chlorine, caustic soda and hydrochloric acid, and is 900 miles from the nearest plant of its kind at Calcutta.

Almost half of India's caustic soda consumption is devoted to the production of soap. A fourth of it is used in the textile industry, and the remainder is taken by paper mills and miscellaneous other industrial concerns.

The new plant, known as D.C.M. Chemical Works, will supply these products to industrial interests throughout northern India, where caustic soda is in particularly short supply.

Foreign Abstracts . . . . . .

Tall oil content of various black liquors

The author (who is head of the Organic Department of the Central Laboratory in Helsinki) made a study both of weak (unconcentrated) and strong (highly concentrated) black liquors in order to estimate the maximum amounts of residual tall oil (soaps) in such liquors. The tall oil content was determined by acidifying the liquors and extracting them with petroleum ether. This extract corresponded to the normal raw tall oil retained. (Ether extracts made on liquor heated with petroleum ether, contained a fairly high lignin content, a low fatty acid content and a relatively high amount of partially oxidized resin acids.)

Assuming that the weight of total dry substance in kraft waste liquors was about 1350 kilograms per ton of pulp, the weak liquors contained approximately 20-58% kilograms whereas the strong liquors seldom contained more than 1.5 kilograms crude tall oil. (In only one case did the "strong liquor" retain 3.6 kilograms of the oil.) The presumption is that these strong liquors had already been "skimmed" for removal of separated tall oil soaps. Six tables are given. Seppo K. Kahila, *Paper and Timber* (Finland) 32, No. 8, 238-42 (1950). (Original in Finnish with English summary.)

Austrian paper statistics

The total paper production in Austria for July, 1950 was 20,140 tons. Of this, 10,907 tons were used domestically and 9,195 tons were exported. The total chemical pulp produced (including 3,153 tons dissolving pulp) was 21,279 tons. Of this 12,957 was used in Austria and 7,367 tons exported. Nearly all of the 7,671 tons of groundwood was used domestically; only 145 tons were exported. The total board production was 4,959 tons, of which only 633 tons were exported. From *Oesterreichische Papier-ztg.* 56, No. 9, 11 (Sept. 1950) (In German).

Reddening of unbleached sulphite pulp

The Section on Wood Chemistry of the Swedish Institute of Wood Research at Stockholm has made a study of the mechanism of reddening, and its possible prevention. The pulp reddening was followed by measuring the reflection of light at various wave lengths, with an automatically recording Hardy spectrophotometer. When measured against a magnesium oxide reflector, a freshly prepared pulp (Roe number 8.4) showed no minima when % reflection was measured against wave length in millimicrons. When, however, a pulp (Roe number 8.9) which had been stored 4 months, was moistened and the reflectance measured, a decided reflection minimum was noted at about 510-520 millimicrons. Evidently the substance which causes the reddening is in the (reduced) "leuco"-form in the original pulp.

Only after the reducing substances in the original pulp (such as sulphites) are destroyed by oxidation due to storage, does the leuco-form oxidize slowly to the red form. This in turn is further oxidized to a gray form. Evidently the red color is not strongly manifested when the stored pulp is air dry but develops rapidly on wetting.

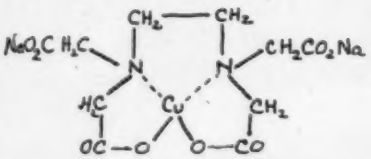


Fig. 1—Complex sodium copper salt of Ethylene diamine tetraacetic acid

When this moistening process is carried out with recently boiled distilled water *under nitrogen*, the red color does *not* develop.

Reddening is brought about not only by air but by such oxidizing agents as hydrogen peroxide, nitrites or hypochlorite, and to produce the color, *heavy metal ions are required as catalysts*. For example, a pulp which contained 50 gammas of iron and 10 gammas of copper, after storage reddened markedly. *However this reddening did not occur when the pulp was first treated with a dilute solution of sodium ethylene diamine tetracetate* (I) which forms stable complex compounds with heavy metals (such as that shown in Figure 1).

When these complexes were treated again with I and washed out with distilled water, the pulp showed little reddening. When, however, this washed pulp was then treated with dilute copper sulphate solution, the typical reddening occurred very rapidly. Hydrogen peroxide acting on pulps washed with I showed no coloration, but the color developed when Cu^{++} was subsequently added. Besides I, sodium pyrophosphate and sodium hexametaphosphate also serve to hinder coloration of the pulp. The practical significance of these findings is discussed very briefly. 14 References and 8 figures are given. Erich Adler and Sten Häggroth. *Svensk Papperstidn.* 53, No. 11, 287-94 (1950). (In German, with English and Swedish summaries).

Sugars in birch and aspen sulphite waste liquors

The methods usually used for determining easily hydrolyzed carbohydrates in wood have given rather unreliable results. Hence, in the present study, more modern analytical procedures have been applied. Both birch and aspen were cooked by the following procedure. A cooking liquor containing 4.0% total sulphur dioxide and 1% lime was used. The ratio of wood to liquor was 1:3.5, and the temperature of the cook was raised to 100 degrees C. within three hours, and then raised within 0.5 hour to 130 deg. Maintained at this temperature for 4.5 hours, the resulting birch and aspen pulps had Björkman numbers of 72 and 64 respectively. The *p*H of the birch liquor was 1.7 and the total solids content was 13.15%. The *p*H of the aspen waste liquor was 1.8; the total solids 12.1%.

The total reducing matter in the waste liquors was determined by the Bertrand procedure, and the total hexose content by Menzinsky's fermentation technique. A "molasses" yeast was also used, which failed to ferment galactose, which was then determined by difference. There was practically no galactose in the aspen waste liquor, and only 0.08% in the birch waste liquor (i.e. 0.3% calculated on the initial wood basis). Mannose and galactose were determined on the basis of the bisulphite compounds formed by these sugars, and by the equilibrium constants given by Jacobus Sundman (cf. Sundman's dissertation, Helsingfors, 1949).

The determination was carried out so that the directly titratable sulphur dioxide and the bound sulphur dioxide in the waste liquor, and the bound sulphur dioxide in the sugar bisulphites were determined *before* and *after* fermentation with yeast from a sulphite alcohol plant (after the addition of varying amounts of sodium bisulphite to the waste liquor). When the galactose bisulphite is subtracted from the total hexosebisulphites, the sum of the mannose and glucose bisulphites is obtained. Each of the aspen liquors contained very nearly the same mannose: glucose ratio (86—or 87:14—or 13). The pentosans in each liquor were determined by differential fermentation (using the methods of Wise and Appling, and of Auerheimer *et al*). The hexoses were first removed completely. Then xylose was determined by means of the yeast *Hansenula suaveolens* and arabinose plus xylose by *Candida guilliermondii*. The birch waste liquor contained 2.77% xylose and no arabinose; the aspen waste liquor contained 2.93% xylose and 0.18% arabinose. The uronic acid content of the liquors was very low (0.21% and 0.15% for birch and aspen liquors respectively). The liquors also retained unidentified reducing substances, (0.58% and 0.43% for birch and aspen respectively). The presence of the various sugars was confirmed by paper partition chromatograms. The work stems from the Finnish Institute of Technology, Helsinki, and was given as a paper at the Annual Meeting of Finnish Paper Engineers Assn., April 22, 1950. H. Roschier and Erkki Aaltio. Paper and Timber (Finland) 32, No. 7, 189-94 (1950). (Original in Finnish, with English summary).

Peruvian Papermaking Material

A possible new papermaking raw material is the tropical hardwood, *Cetico*. This tree makes a phenomenal growth to a trunk diameter of 8 to 10 inches within 2-3 years, and grows wild in very large quantities. It is found in the upper reaches of the Amazon, in that part of Peru which is separated from the coastal regions by the Andes mountains. An aerial survey showed that it was

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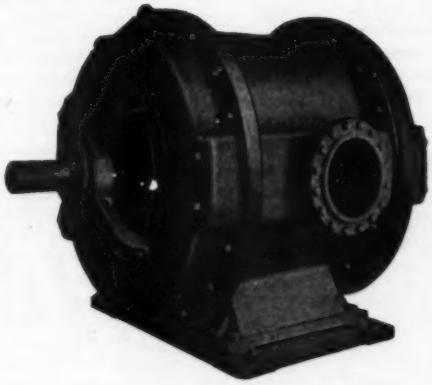

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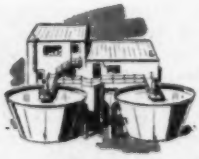

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a promising timber which could be driven to the mill by river transport but that it might be difficult to transport the pulp to industrial areas.

Preliminary pulping runs were made at one of the mills of Cartiere Bosso in Italy. These were considered satisfactory, and the Cellulose Development Corp. is gathering cost data for the possible erection of a groundwood mill in the Amazon region. Anon. *The Paper-Maker* 120, 414 (1950).

The "secondary" heat problem

"Primary heat" (so-called) in the pulp mill includes the calories delivered by live steam for actual pulp production. "Secondary heat" is waste heat which could be reclaimed for useful work. The author in a lecture deals with this secondary heat, and indicates where such heat is available and where it may be utilized in the case of four different types of pulp mills (an unbleached and a bleached kraft mill, a mill making strong sulphite pulp and one producing dissolving pulp). The two latter also undertake alcohol fermentation. The author also discusses very briefly the waste heat problem in paper, board and groundwood mills. Reference is also made to the planning and maintenance of waste heat installations. Börje Thorson. *Svensk Papperstidn.* 53, No. 13, 361-5 (1950). (Original in Swedish, with a brief English abstract.)

Sulphite cooking control based on liquor viscosities of pine or spruce

In the sulphite digestion of pine or spruce three phases may occur. (I) There was an initial impregnation stage during which both the viscosity and the specific gravity of the cooking liquor decreased. (This usually required 3-4 hours from the start of the cook, and proceeded (in the case of spruce) up to a temperature of approximately 80-85 degrees C.). This period was characterized by a diffusion of liquor components into the wood (II). In this stage, (which occurred ordinarily at temperatures of 80-110 C.) impregnation continued; the viscosity gradually rose but the specific gravity still dropped.

Paralleling the absorption of sulphur dioxide by the wood and the diffusion of calcium and bisulphite ions into the cells, there was a conversion of the initially insoluble calcium lignosulphonate into soluble lignosulphonates. This "hydrolysis" caused an increase in viscosity of the liquor; on the other hand, continued diffusion of calcium and bisulphite ions into the wood was sufficient to cause a further decrease in density of the liquor. Another less obvious reason for increase in viscosity appears to be the transitory hydrolysis of hemicelluloses entering the liquor (III).

This final stage (at temperatures of 110-140 deg.) involved very rapid increases both in viscosity and specific gravity of the liquor due to the solubilizing of ever-increasing amounts of modified wood components. When under an entire series of cooking conditions the Björkman chlorine number of a pulp was plotted against the viscosity of the liquor (*taken at the end of cook*), a smooth curve (which is not quite linear) resulted. In other words, as the viscosity is augmented, the degree of delignification also increases, (i.e. the chlorine-number of the pulp drops).

Thus it is possible to determine the optimum cooking conditions for a specific type of pulp by measuring the viscosity of the liquor, and a control method may be evolved. Whereas the correlation between delignification and viscosity of liquor is very satisfactory, no such relationship is established between "absolute specific gravity of the liquor" and chlorine number of the pulp. Seven graphs are given. Viscosity decreases and increases (at the various stages) were much sharper in the case of spruce than in pine. (In the latter case, slight viscosity rises were already noted at 70 degrees C.) J. Marchlewska-Szrajerowa, and W. Surewicz. (Central Laboratory of the Paper Industry in Lodz, Poland). *Chimie et Industrie* 63, No. 3bis, 580-583 (1950) (In French).

France Needs Wood for Papermaking

Only 20% of France's area is still wooded, somewhat less than the figure of 25% for the rest of Europe. France is, in general, not heavily forested, except for certain regions, notably the Vosges, the Landes and the Alpine areas.

Hardly 33% of the 108,000 square kilometers of forests contain woods presently utilized in the making of paper, namely softwoods, 12% being maritime pine, 7% Scots pine, 6% fir and 3% spruce. Because of the heavy competition from other industries, only a small portion of the cut wood is utilized in papermaking.

Considering the supply, the annual production of wood for industrial consumption should be limited to 10,200,000 cubic meters (steres). Due to over exploitation in recent years, however, France has produced an even larger figure. This is bound to result in a decrease of the available supply in the future. The consumption of the domestic wood for papermaking was only 500,000 steres in 1937, and in 1947 the figure was 600,000. Thus a large part of the wood imported annually (which was 2.2 million steres before the war and 3.1 millions in 1947, and consisted almost entirely of softwoods) was destined for use in paper production.

It is believed that France needs between 600,000 and one million steres of foreign pulp woods a year. She produces domestically about as much as that, 50% of which consists of maritime pine from Les Landes. Thus the better half of the wood which is used by the French paper and pulp industries is of foreign origin.

Between the two wars, Russia furnished the major part of the imported woods consumed in French papermaking. Since the last war, however, all attempts to resume normal trade relations with Russia have failed. Thus it was necessary to look elsewhere for the wood needed to revive the paper industry.

After the Germans had systematically pillaged French forests during the occupation, France, with the backing of the Allies, removed ten million steres of wood from the Black Forest as reparations in 1948 and 1949. The paper industry received one-fifth of this stock, or the equivalent of two years of normal imports.

France has thus been accorded a short respite in the solution of its wood supply problem. Should Russia maintain its present attitude, finding a source for the necessary supply will not be easy. Finland can be counted upon to supply about 300,000 steres a year. Canada, despite its large forest resources, must be ruled out as a major source, owing chiefly to France's inability to pay dollars.

The problem of supplying wood for the paper industry is far from being resolved. If France is eventually forced to increase its imports of finished pulps, it would have a great effect on the world market. Some think that France can avoid the recourse to importing foreign pulps, if she could succeed in developing processes for the making of paper from hardwoods, straw and reeds. It is still impossible to predict how successful the research in these fields will prove.

—Unpublished article from *Extinfor* (Pages de France). By S. Beracha.

Polysaccharide hydrolysis during the sulphite cook

A significant portion of certain of the polysaccharides originally present in the wood is hydrolyzed during any sulphite digestion. Not only is the pulp yield influenced by such a hydrolysis, but pulp quality depends on how this hydrolysis proceeds. The object of the present study was to determine the relative resistance of the polysaccharides to acid attack. Samples of the liquor were taken from the digester at intervals during the cook and the various sugars in these samples were determined qualitatively by means of paper partition chromatography. The woods cooked were spruce, pine, aspen and birch.

All waste liquors were shown to contain (at some stage of the cook) mannose, galactose, glucose, xylose and arabinose, but the quantitative differences were marked (especially in the case of mannose and galactose in the waste liquors from hardwoods on the one hand and from softwoods on the other). However, the wood species does not influence *the order* in which the various sugars are removed from the wood. Even before the temperature in the digester had reached 100 deg. arabinose was found in the liquor. Soon thereafter (or at times simultaneously with arabinose) xylose and galactose were also present in the cooking liquor. Hydrolysis of the mannan, however, starts much later (not before a temperature of 130 C. is reached). Glucose appears thereafter and is due primarily to degradation of cellulose. In production of a dissolving pulp, glucose was discovered in the liquor only when the temperature had reached 140 C. However glucose also was present to a certain extent when a cooking temperature was maintained several hours at 130 C. (as is customary in the production of strong sulphite pulps).

An excellent series of chromatograms show the relationship between appearance of the sugar and cooking time. Fifteen references are given. Jacobus Sundman. *Paper und Timber*, 32, 267-74 (1950). (Original in Swedish with an English summary).

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TAPPI Paper-Plastics Conference

(Continued from page 988)

III—Cellulose—accessibility, reactivity and properties relating to plastics

Session Chairman, Forest A. Simmonds, U. S. Forest Products Laboratory.

Discussion Leader, Dr. John A. Howsman, American Viscose Corp.

1—"Pulp property requirements for dissolving pulps," by Robert H. MacClaren, Eastman Kodak Co.

Dr. MacClaren pointed out that the use of wood pulps in the nitration and viscose processes involves little difficulty but that in acetylation there are several problems most of which resolve around the lack of clarity in the solution and the film. An example of the difficulties involved is illustrated by the use of distilled water. If distilled water is used to wash the pulp, one will end up with a muddy acetate film. It is necessary to have calcium ions present to neutralize carboxyl groups. Even a very small amount of carboxyl is of consequence. Dr. MacClaren pointed out that it is difficult to evaluate pulp for acetylation except by actually acetylating.

2—"Kinetics and equilibria in cellulose reactions," by H. M. Spurlin, Hercules Powder Co.

Dr. Spurlin pointed out that such terms as accessibility, crystallinity, and so forth, must be defined in terms of the methods of measurement, and he compared data obtained by different methods. He discussed at some length the heterogeneity of cellulose dwelling particularly upon Timell's work.

A discussion of accessibility must be defined in the terms with which one is working such as acetylation, moisture adsorption, xanthation, and so forth. The same measurements can not be used in all cases for different processes.

3—"The accessibility of cellulose," by Harold Tarkow, U. S. Forest Products Laboratory.

Dr. Tarkow discussed various methods for arriving at a value of accessibility and described in detail the work of the Forest Products Laboratory on the new method based on the ability of formic acid to react only with the primary hydroxyl group in the anhydroglucose residue. A relatively non-crystalline material like starch forms only a monoformate. Different celluloses acquire formyl contents less than that for a monoformate with the values decreasing appreciably between that for rayons and that for native cellulose. The ratio of the formyl content to that for a monoformate is assumed to be the fraction of readily accessible material. The values obtained are in agreement with those arrived at by the other nondestructive chemical methods.

4—"Accessibility as determined by formic acid esterification," by R. F. Nickerson, Monsanto Chemical Co.

By formulation of starch and other amorphous polysaccharides, Dr. Nickerson pointed out that one can arrive at a figure for theoretically complete accessibility. Then by carrying out a formulation of cotton, wood pulp, and so forth, it is possible to get a value which may be expressed as a per cent of the formulation of a completely accessible material and that this can then be considered an accessibility value. Dr. Nickerson pointed out that time is an important factor, and that even with a crystalline material slow breakage of crystalline bonds takes place so that there is a continued slow increase in formal content. Therefore, it is important to take time into consideration and this he did by extrapolating his values back to zero time. In this way Dr. Nickerson believes it is possible to arrive at a fairly accurate value for true accessibility.

IV—Plastic coating fundamentals

Session Chairman, Dr. R. T. Nazzaro, New York State College of Forestry.

Discussion Leader, Dr. R. H. Kienle, American Cyanamid Co.

1—"Alathon polyethylene coatings—properties and techniques," by Alfred Stockfleth, E. I. duPont de Nemours & Co.

Mr. Stockfleth discussed the use of polyethylene for paper coatings from the point of view of its inert properties and its resistance to moisture vapor transmission. He contrasted these properties in film formation and in hot melt applications. The resistance to moisture vapor transmission for the most part is the most important use property. Mr. Stockfleth also brought out the stress-strain changes with temperature and showed that the polyethylenes were quite dimensionally stable. Polyethylene is useful at a wide range of temperatures which makes it particularly important in frozen food packaging. In the discussion following the paper Mr. Stockfleth pointed out that it is possible to look forward to the application of polyethylene to paper by means of organosol and aquasol coatings which, of course, are more directly usable by the paper industry.

2—"The effect of compounding variables on styrene-butadiene latex used for protective coatings for paper," by M. E. Wendt and William H. Aiken, The Goodyear Tire and Rubber Co.

Mr. Wendt presented this paper and pointed out that such a study was made of the use of a coating composition of a butadiene-styrene copolymer latex, an emulsified wax and a thickening agent. Emphasis was placed on obtaining a coated paper with good grease resistance and a low water vapor transfer rate. Best results were obtained in combination with high melting point microcrystalline waxes. At least 30 parts of wax per 100 parts of latex solids were necessary to give low water vapor transfer rates. The use of a thickening agent improves resistance to passage of water vapor and also reduces the tendency toward foaming. The coating must be heated to a temperature of almost 180 degrees F. to produce a continuous film of coating on the paper. Maximum properties were obtained by fusion at 300 degrees F. In the laboratory with a 30 lb. super-calendered kraft paper a water vapor transfer rate of 1 gram per 100 square inches for 24 hours was obtained with approximately 15 parts per ream of coating. The sheet also had excellent grease resistance. Mr. Wendt pointed out that the same results have been obtained with production equipment at half this coating weight, and that these properties were not appreciably affected by creasing the sheet.

3—"The technology of styrene latex paper coating," by Eli A. Haddad, Monsanto Chemical Co.

Mr. Haddad reviewed the technology of styrene latices and their application to paper giving details with respect to one type of "lustrex" latex. He pointed out that the formulation of "lustrex" latex paper coating is still in the initial stages of development. One of the main factors apart from plasticizer incorporation is the use of thickening agents and modifiers. Of particular interest is the use of an alkali soluble styrene co-polymer which reacts with ammonia or alkali metal hydroxides to form water soluble salts. Mr. Haddad pointed out that the so-called short medium and long formulation differ mainly in the concentration of plasticizer to resin. The difference in composition obviously yields products of varying degrees of flexibility.

4—"The versatile vinyl enters the paper coating field," by A. L. Hatfield, B. F. Goodrich Chemical Co.

Mr. Hatfield described procedures for the formulation and application of vinyl chloride and vinyl chloride copolymer resins as plastisols, modified plastisols, solutions and latices. He placed particular emphasis on latices inasmuch as vinyls in this form can be handled by either an on- or off-machine paper coating process. This flexibility of application makes it possible for the paper producer to coat his own board in the manufacture of grease and moisture proof paper products. Mr. Hatfield cited other applications for both functional and highly decorative vinyl coatings.

Convention Papers . . . Abridged

Corrugated Containers

Following are short digests of talks given at the November, 1950, meeting of the Chicago Section of the Technical Association of the Pulp and Paper Industry on the subject of corrugated containers:

S. F. Thune, sales manager Midwest Div., National Starch Products, Inc.

The basic theory of the starch process for combining corrugated board was reviewed briefly by the speaker. The development of chemically modified starches which have higher viscosities, lower gelatinization temperatures, better breakdown resistance on prolonged agitation, and greater stability on cooling were described. The results of these developments were the use of less starch, higher speeds due to lower swelling temperatures, better bond due to quicker grab produced by the higher viscosity, more uniform pasting due to greater uniformity of starch suspension, and better results with V-board. Much research has been done on an alkaline starch adhesive for V-board, but nothing tangible can be reported as yet.

In regard to the availability of starch, the speaker mentioned that the plant capacity of the wet millers was somewhat greater than at any time in the past, and that the supply should be ample unless an artificial shortage is created. The backlog of orders created by the increased consumption and increased inventory following the Korean outbreak is being reduced, and the situation should be normal in the near future. Finally, the work on synthetic resin adhesives for use with ungummed tape and the glued lap containers was mentioned.

Art Sperling, plant engineer, Downing Box Co.

This was a discussion of Preventive Maintenance in the Box Shop. The speaker defined preventive maintenance as: "A means by which, through scheduled periodic inspections of buildings and equipment, the need for repairs may be discovered prior to point of failure and shutdowns can be planned and repairs scheduled in advance of costly and annoying breakdowns." In developing a maintenance program, responsibility must be delegated for preventing and repairing building and equipment breakdowns. The department must be set up with competent supervision, adequate and balanced manpower, and good tools and ma-

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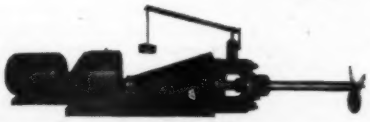

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chines. Simple workable schedules for processing and receiving requests must be set up. The preventive portion of the maintenance program must provide schedules for inspection and methods of record keeping. The preventive inspection jobs should be paralleled with the regular maintenance requests as much as possible.

The factors usually given as hindrances to the formulation and carrying out of a good preventive maintenance plan are the increase in clerical and supervisory employees required, the already too large load of regular maintenance requests, and the fact that continuous operation provides no downtime for inspections until breakdown occurs. To overcome these objections, concentrated effort should be made to clean up all maintenance requests by use of outside help and contractors, the department supervisors should go out of the way to find things with which to load their request sheets, and an educational program should be instituted to teach supervisors more about their equipment; so that they can locate troublesome noises, belts, etc. Better planning by the maintenance department supervisor, and the gradual building up of the preventive maintenance aspects, starting perhaps with new equipment, will also help. A strong housekeeping program is vital to a good maintenance system. Thus the main features of a simple, workable system are:

1. Establish a top-notch maintenance department.
2. Establish channels for receiving and processing work requests.
3. Develop sound work scheduling procedures.
4. Delegate responsibility for up-keep of buildings and equipment.
5. Maintain scheduled periodic inspections.
6. Keep your house and system in order.
7. Know what your men are doing and when and where.
8. Keep repair and inventory records.

Don Santmyers, Grasselli Division, E. I. du Pont de Nemours, Inc.

The speaker, who is Industrial Products Development and Service Representative, opened his remarks by stating the main advantages of sodium silicate as an adhesive in corrugated board manufacturing. These are low cost, uniformity of adhesive solution, shipped ready for immediate use, and capable of producing a smooth, firm board of highest crush and compressive strength. The main disadvantage of silicate adhesives is the adhesion to hot plates and to other machine parts. Another operating problem is that of so-called "dusting." "Dusting" occurs because all the silicate does not penetrate into the board, and it is overdried on the hot plates and flakes off. Moisture near the surface is needed to get the silicate to wick into the board. Mr. Santmyers demonstrated this by using a moistened cellulose sponge and a dry cellulose sponge to blot water spilled on the speakers' table. He then went on to quote test results from a study made at the University of Michigan to show the increased rigidity and compression strength obtained by using heavier silicate adhesive films.

The most important single factor in the use of silicate for corrugating is the condition of the adhesive rolls and the clearances used. A rule of thumb value of 1 pound of silicate per 0.001" glue roll clearance can be used to compute the increased costs incurred by use of large clearances. Roll clearances should be checked and adjusted; if they get out of line because of wear the rolls should be reground or replaced. If the wear exceeds 0.002", consideration should be given to replacing the rolls—the glue savings will pay for the replacement in a short time.

C. J. Zusi, vice president Container Laboratories, Inc.

This discussion of "Testing and Quality," was prefaced with the question "How good are you?" He continued by stating that most people are interested in knowing how they measure up to what is expected of them and what they expect of themselves. The manufacturer needs an evaluation of the efficiency of his fabrication methods and the strength of the resulting box. The user must know how well his package will perform the functions for which it was designed. The only way to find out and to make sure that satisfactory containers are produced is to have quality control tests made regularly. This is because materials vary, and fabrication may fall below standard. The kinds of tests to be made depend upon the purpose of the check. There is no universal program—it must be set up to suit the purposes for which the tests are to be made. The purposes of the maker of the boxes are attained by making tests on the component materials, the flat sheets of combined board, and the empty containers. If the ring stiffness test results along the grain of the board and across the grain is known, it is possible to calculate what the boxes made from those sheets should withstand in top-to-bottom and in end-to-end compression. Comparison of the actual compression test results with the forecasted result yields a fabrication efficiency rating.

The problem of the user of the boxes is quite different than that of the maker. He wants to know whether the box will function satisfactorily in actual use. Testing programs for users should be the result of the combined efforts of the shipper's representatives and the testing laboratory after study of the nature of the product shipped, the filling, handling, storing, and shipping hazards and merchandising conditions. Sampling is an important point because, if the specimens are not representative of the lot being checked, the tests can not be worth much. Cost tends to make tests on empty containers preferred to tests on filled containers. The tests on filled containers should be made in a cycle designed to simulate the service conditions expected in the use of the containers. The fundamentals of a sound quality check program can be seen to be: (1) clear definition of the purpose, types, and performance levels expected of the various tests; (2) adequate and truly representative sampling; (3) performance of testing on suitable machines operated by competent personnel and interpreted by qualified technicians; (4) performance of tests at regular intervals.

Vegetable adhesives for packaging machines and future adhesive requirements for speed packaging*

ROGER SHOALS
Adhesive Department Manager
Stein-Hall & Co., Inc.

My subject tonight is to be adhesives made from various types of carbohydrates. Indirectly, this subject is very closely associated with the paper industry because after you make the paper we have to glue it to-

(*) Abridged from paper given at Chicago, May 15, 1950, before the Chicago Section of the Technical Association of the Pulp & Paper Industry.

14 MONEL-COVERED ROLLS INSTALLED 14 YEARS AGO... *and Still Going Strong!*

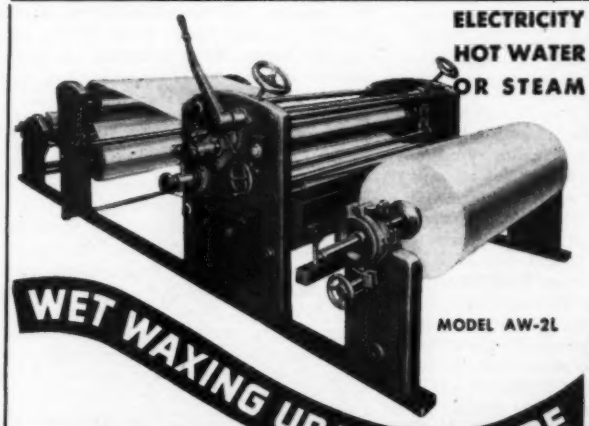
14 is the Lucky WELDCO Number!

● For long service records, you can't top Weldco rolls. These 7 rolls, and 7 others just like them, were installed in 1936 in a Delaware fibre board plant, and they're still on the job! They are cast iron dryer rolls, 36" diameter x 69" face, covered with a solid layer of 16-ga. Monel.

Originally, they were worn cores, corroded by dilute zinc chloride. Now, with corrosion-resistant Monel covers, the rolls are more efficient than when new, for Monel guards against acid attack indefinitely . . . outlasts cast iron many times. In addition, it (1) saves the cost of new cores, (2) eliminates frequent regrinding (reducing "down time"), (3) has practically the same coefficient of heat expansion as cast iron and steel. With this property, there can be no loosening of the cover.

Both new and old rolls can be furnished with wear-resistant, corrosion-resistant Monel covers. Ask any paper machinery builder about them, or contact . . .

THE YOUNGSTOWN WELDING & ENGINEERING COMPANY
3714 OAKWOOD AVENUE . . . . YOUNGSTOWN 9, OHIO



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HOT WATER
OR STEAM

MODEL AW-2L

WET WAXING UP TO 80" WIDE

A new model Wet Waxer . . . featuring compact construction, functional flexibility of use, high speed, and electric, hot water or steam heating. Built in widths from 10 to 80 inches. Other models available for dry or contact waxing. Write for further information.

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PERFECT REGISTER ...TREMENDOUS SPEED

THIS brand new No. A-4 aniline printing press offers perfect register at highest speeds on cellophanes, foils, and other materials your customers require for wrapping their products. Many other models in our complete line of presses are available for the aniline printer. Write us for complete detailed descriptions.

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gether in the various forms that people desire it, whether it be paper bags, boxes, envelopes, cartons or whatever it may be.

I shall confine my talk to dextrines, which are still the basis for most of the adhesives that are used in this country today. Unfortunately, nothing that we make from starch sticks as hard as starch itself; everything that we do to starch takes away stick. The dextrines that are made today do not differ too much from the dextrines that were made fifty years ago. True, we know how to apply certain principles to dextrine much better now than we used to. For instance, the envelope industry still has pretty much the same problems today that it had thirty-five years ago. Dextrines normally will handle about 85% of all the standard paper for front seal work, but that remaining 15% still causes trouble. This paper, of course, is the rag content bond paper.

The technique of converting dextrine has vastly improved, in fact it has even been converted with electronics, whereby the conversion takes place instantly. The specifications for all dextrines are relatively simple, and include color, viscosity, *p*H, sugar content and solubility, but in order to obtain all of these qualities it is necessary to jockey formulas around quite often to continue to produce uniform products. And, in my mind, the most important thing that we have to do is to make uniform products. This is not as easy as it sounds. The dextrine manufacturers leave no stone unturned to accomplish this. It might interest you to know that the most common materials used to make these products are corn, starch, and tapioca flour. There is some potato and sago used, but corn is by far the largest produced.

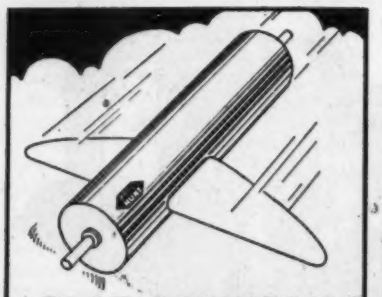
Tapioca is imported into this country in substantial quantities but all of the tapioca imported is not used by the adhesive manufacturers; only the very top grades are used in the manufacture of tapioca dextrine and these dextrines must have built into them certain characteristics for the most exacting type of work. At the present time most of our tapioca is coming from South America and in the last few years they have improved the quality of their flour greatly. It might also interest you gentlemen to know that prior to the war all the tapioca that we imported came from the Dutch East Indies, and at the time of the Pearl Harbor disaster our supplies were cut off just like you would turn off a running faucet. This left our industry in a chaotic condition because we had been firm in our belief that in order to make the top quality dextrine for the type of work we specialize in, tapioca was a must.

I think the adhesive manufacturers, as a whole, did a splendid job in keeping the industry running at wartime capacity with improvised material. We still cannot report to you that we are out of the woods as far as tapioca is concerned. We have received some token shipments from Java and we expect more as time goes on. Within the next year or two we should be back in business on tapioca. This will help us a great deal, as industry is calling on us now to produce better products to meet their demands for increased production with less help.

This demand is brought about by the fact that they must produce more with less people in order to remain competitive due to increased labor cost. The packaging industry started this by asking the machine builders to construct faster machines. This they have done. Recently I visited a packaging plant that used to think they were doing very well when they sealed 80 packages per minute; they are presently sealing between 200 and 300 packages per minute. The machines they are using are capable of sealing 400 to 500 packages per minute, and the only thing that is preventing them from doing this is an adhesive that will perform at this speed and does not cost five to six times more than that which they are now using. To top this off, I was just reading in a publication about a new machine that was being imported into this country, and the advertisement stated that the machine would make 3000 paper bags per minute. We will make adhesives to accommodate the 3000 bags per minute.

This is not an unusual problem for us to be faced with. As a matter of fact, in my mind this is what we have to look forward to in the very near future in all types of packaging and the manufacture of products from paper. We are endeavoring to gear our development work to meet these demands. Any help that we can get from the machine builders prior to the installation of new high speed equipment and any advance notice that we can get from the paper manufacturers will be extremely helpful in aiding this cause. We do not seek this help and co-operation to shirk on our research work. We are installing and developing in our laboratories every type of apparatus for testing material that we can obtain or think of. We do seek the co-operation of the paper man and the machine man because we feel that the three of us have a mutual interest in seeing that the march of progress continues.

▶ MINIATURE COMBINATION SPEED DRIVES—These units offer integral combinations of standard variable and fixed ratio drives. For very low power applications requiring both speed reduction and variable speed, these instruments deliver 2 pound-inches of torque. By combining the variable ratio unit with the proper fixed ratio, a variable output speed is obtained at any desired nominal speed, infinitely adjustable from 1/6 to 6. Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.



FAST DELIVERY ON "SHAF-TITE" ROLLS

FOR WET FELTS

plus patented features that give greater value.

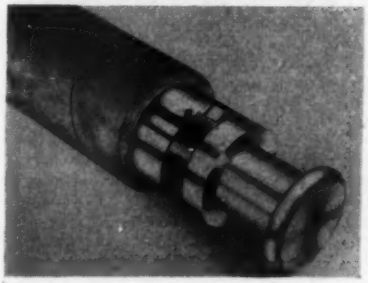
Write for Catalog!

RODNEY HUNT MACHINE COMPANY
38 Maple Street, Orange, Mass., U.S.A.

The Paper Industry New Products

Lightweight Arbor

Prevents damage to roll butt.



The "Corloc" arbor is built of special alloy extruded aluminum in a design that eliminates cams, set screws and heavy wedges. It can be used in cores made from aluminum, steel, strawboard, paper or fiber with 2 in. inside diameter up. It locks cores from 4 in. to full length. Guaranteed not to damage cores or roll ends, it locks from the center with a single twisting motion. This feature is also said to reduce lost time accidents in fastening the arbor in the roll. Available in various sizes. Bird Machine Co., South Walpole, Mass.

Nozzles for Tank Heating

Cut replacement costs.

Improvement in tank heating of liquids, using "Sparger" pipes, has been effected by the use of "Sparger" nozzles to force steam from the pipes through the tanks rather than, as in the past, letting it percolate through the tanks from holes in the pipes. Fitting the pipes with these nozzles has been found to improve efficiency and cut down replacement cost of pipes. With the nozzle, replacement of pipes due to wear at the opening from corrosion and high steam velocities is unnecessary, since it is a simple matter to thread a new nozzle to the pipe when the old one is worn. The pipe itself remains intact.

One nozzle in a 100 gallon tank will circulate 20 gpm of water and will raise the temperature of the tank liquid 40 deg. in 11 minutes, with steam at 183 lb. per hour and 40 psi. "Sparger" nozzles are available in bronze, cast iron, stainless steel and Haveg. Schutte and Koerting Co., Dept. JB, 12th and Thompson Sts., Philadelphia 22, Pa.

Oxygen Analyzer

Completely automatic—no chemicals used.

The "Beckman Oxygen Analyzer" was developed in wartime and only recently released for general industrial and scientific applications. The unique operating principle is based on the fact that oxygen is strongly paramagnetic (attracted into a magnetic field), whereas other common gases, with few exceptions, are slightly diamagnetic (repelled out of a magnetic field).

This property of oxygen is of such magnitude that it is possible to determine oxygen concentrations of only a few ppm by measuring the magnetic susceptibility of the gas. By the use of simple electrical circuits, many useful features are made possible, such as easy standardization, multi-ranges, high sensitivity and accuracy, and remote indication and control. The entire range of oxygen concentration is covered, from a few ppm to 100 per cent oxygen. High accuracy at any concentration can be achieved by appropriate selection of scale range. A. O. Beckman, Inc., 11 W. State St., Pasadena 2, Calif.

Steam Trap

Has built-in brass strainer.

The new No. 881 steam trap is designed for draining smaller sized equipment producing relatively small amounts of condensate. Since such traps have a small discharge orifice, good practice recommends that a strainer be installed ahead of the trap to avoid clogging. The built-in strainer eliminates separate strainer, extra fittings and installation labor.

The new model is a development of the No. 880, but is larger and designed for higher capacity and pressure requirements. Specifications are: ½ or ¾ in. pipe connections, 250 psig, 769-1060 lb. per hr. hot condensate capacity, 7-1/16 in. height, 6 lb. weight. Armstrong Machine Works, Three Rivers, Mich.

Automatic Flow Controller

Provides lower maintenance with higher accuracy.

In this new combination of an accurate flow meter with a sensitive controller, flow rate is measured by the "Penn Magna Clutch Flow Meter" which utilizes a frictionless magnetic coupling between the float on one hand and the pen and control mechanism on the other. To this is added the sensitive pneumatic controller. Low maintenance is achieved by eliminating the stuffing box or pressure tight bearing, and by the use of "O" ring manometer seals in place of gaskets.

The manometer is fully accessible without disconnecting the pressure piping. Both nozzle and restriction have sapphire jewels to prevent wear. Restriction may be cleaned while in service, and the entire controller or just the control head may be removed from the case with a minimum of effort. Penn Industrial Instrument Corp., 3116 N. 17th St., Philadelphia 32, Pa.

Patented Tube Fittings

Provide vacuum tight seal.

"Swagelok" fittings are designed to eliminate small leaks, and it is said that laboratory tests show that when they are used on tubing of aluminum, brass, copper, steel, stainless steel or plastic, the tubing will burst before the fitting will leak.

The fittings come completely assembled, finger tight. No flaring of the tubing is necessary. During assembly the tubing remains stationary throughout the brief tightening operation. Thus, no damaging torque or twisting is transmitted to the tube. "Swagelok" fittings are available in brass, Monel, aluminum, steel and stainless steel. They are made in sizes for use with tubing ⅛ to 1 inch outside diameter. Crawford Fitting Co., Cleveland, O.

Acrylic Acid in New Form

Useful in adhesives, plastics, synthetic rubber.

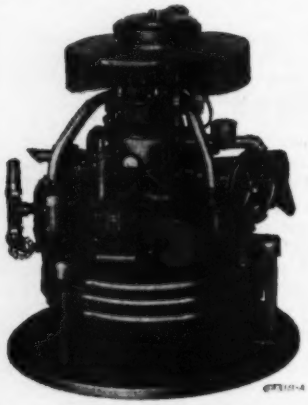
Acrylic acid, a derivative of beta-propiolactone, has been available only in water solution and has not been commercialized in this country. Now, for the first time, it will be available in the glacial or "dry" form, with over 97 per cent purity, and containing less than 1 per cent water. The new glacial acrylic acid is expected to find wide usage in the plastics industry as a monomer, and in the chemical industry in general as an intermediate for the preparation of esters and other derivatives.

High molecular weight acrylate monomers can be polymerized and used in the manufac-

ture of pressure-sensitive adhesives and surface coatings on fabric, wood, metal, paper and leather, and can also serve as modifiers in the compounding of plastics and synthetic rubbers. B. F. Goodrich Chemical Co., 324 Rose Bldg., Cleveland, O.

Portable Air Compressor

Engine and compressor built as one.

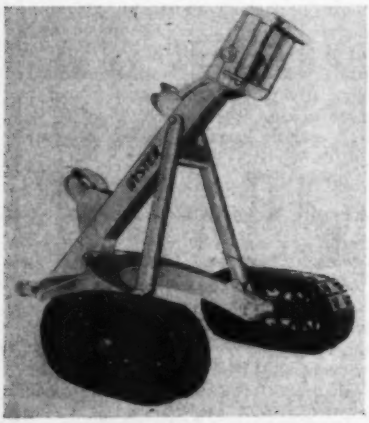


New design principle and great portability are the features of this 36 cfm "Spot-Air Compressor," NR-3R-36. It weighs only 265 pounds and stands 32 inches high on a baseplate 27 inches in diameter. A special wheelbarrow mounting enables one man to take the compressor and air tools almost anywhere.

A horizontal arrangement of three power cylinders and three air cylinders, spaced alternately at 60 deg. intervals around a vertical single-throw crankshaft, gives a smooth conversion of engine power into air power without the need of a heavy flywheel. The fuel-tank capacity permits from 2 to 2½ hours continuous operation. Ingersoll-Rand Co., 11 Broadway, New York 4.

Logging Arch

New design reduces weight, adds height and power.



A new logging arch known as the Model 78, for use with "Caterpillar" D7 and D8 track-type tractors, is materially reduced in weight while retaining the same strength and balance as this company's previous model. Approximately one foot has been added to the top of the main roll height. In addition, the new design permits the arch to operate behind larger tractors with higher horsepower when additional pull is required.

The new arch is of the basic A-Frame type of design with box-type structural members. It is used in conjunction with a tractor-mounted winch. Logs with pre-set chokers are winched to the arch, the butt ends are hoisted under the boom of the arch, and then the load is hauled to the tractor landing. Additional specifications are given on this company's form 1160. Hyster Co., Portland 8, Ore.

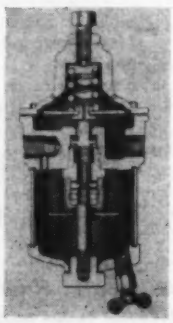
Pipe Connection Clamp

Taper seal idea.

Making lateral pipe connections to branch and main pipelines is said to be simplified by a new type single-strap clamp. This new product makes unique use of special shaped molded rubber and oil resistant type gaskets to effect a leakproof taper seal for the clamp. A principal feature is a wedging action of the resilient gasket which develops partly from hydraulic pressure within the pipe plus only a moderate tightening of the strap nuts. The taper seal was originally developed for asbestos-cement pipes but is now in production for light wall steel pipes. Smith-Blair, Inc., South San Francisco, Calif.

Air Filter and Regulator

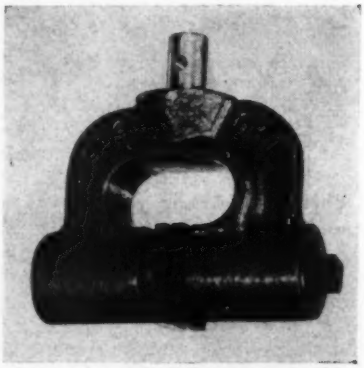
Resistant to corrosive atmospheres



This unit combines regulator, filter and dripwell. It is known as the "Airpak" and is constructed entirely of brass and stainless steel. Capacity averages approximately 25 cfm, and yet the unit is compact and small in size. It can be mounted horizontally or vertically. Three ¼-inch N.P.T. taps permit multiple reduced pressure connections and integral pressure gauge mounting. "Airpak" is available in reduced pressure ranges of 0-25, 0-50, and 0-125 psig. Conoflow Corp., 2100 Arch St., Philadelphia 3, Pa.

Tensile Testing Jaws

Statically balanced.

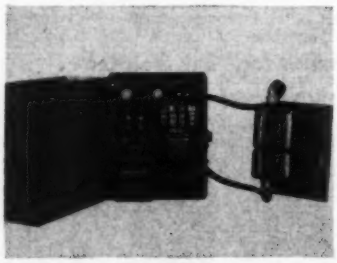


A group of new type tensile testing machine jaws are said to increase gripping efficiency and minimize jaw breaks. The new features are: (1) self-alignment of the gripping faces, (2) positive restraint of motion of the gripping surface in the direction of pull, and (3) a new resilient follow-up action. The latter development is found in the three larger models, and is achieved by using resilient Nylon members in the jaws. The jaw frames are made of high-strength aluminum or steel alloys with stainless steel threaded inserts and working parts.

Four models, with load capacities from 50 grams to 1000 pounds. Instron Engineering Corp., 2 Hancock St., Quincy 71, Mass.

High-Speed Register Regulator

Reduces size of register marks



The RR-11 register regulator is designed for wrapping machines utilizing such wrapping materials as metal foil, waxed paper, cellophane and cloth. A prefocused optical system is used. The unit is said to be accurate to 1/16 inch over a wide speed range. A toggle switch control is used to switch from reflected to transmitted light, and for dark- or light-spot operation. The regulator has terminal blocks for external connections and is supplied complete with an armored cable with plug connectors at both ends, for ease of installation and servicing. It uses standard vacuum tubes. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

Water-Resistant Adhesives

Meet Army-Navy specifications.

This new line of water-resistant resin adhesives was developed to meet joint U.S. Army and Navy packaging specifications. Several grades of adhesive are available, with various setting speeds. The fast set-

COMPLETELY PACKLESS
SELF-LUBRICATING
SELF-ADJUSTING
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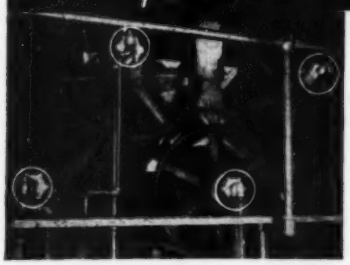
Only Johnson Joints offer *all* these cost-cutting, trouble-saving, production - boosting benefits. *Only* Johnson Joints end *all* the shortcomings of old style stuffing boxes, without compromise of any sort. No wonder so many hundreds of mills, and so many machinery manufacturers, have standardized on Johnson Joints. Why not find out how quickly Johnson Joints can pay their own way in your mill.

Johnson Rotary Pressure Joints



Write for catalog showing sizes and styles for all needs.

Installation in a midwestern mill — some of the 562 Johnson Joints purchased by this company.

The JOHNSON CORPORATION, 845 Wood Street, Three Rivers, Michigan

Here's what you get

with NUGENT FILTERS

for fuel and lube oil

- More filtering area
- More effective filtering
- Choice of full flow or by pass filtering
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- Simple piping
- Capacities to meet every need

NUGENT Absorbent Type Fuel and Lubricating Oil Filters pay off for you in many ways—they conserve your oil . . . they extend the life and improve the service you get from your equipment . . . they are available at the lowest over all cost per square inch of filtering area. Add to these such additional advantages as ease of installation, economy of recharging and high filtering efficiency and you'll see why we say you can't afford to be without Nugent Filters.

Write today for descriptive literature outlining the nature of your filtering problems. It's the first important step towards big savings.

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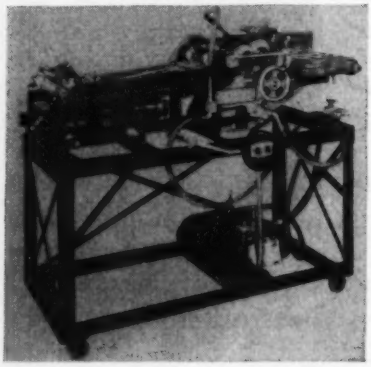
Oil Filters, Oiling and Filtering Systems, Telescopic Oilers, Oiling Devices, Sight Feed Valves, Flow Indicators . . . Representatives in Principal Cities

ting varieties are for machine use, while slower setting grades can be applied by hand brush. Each grade meets specification strength and water immersion requirements. These adhesives are being used for case liners for wooden boxes, water-resistant paper bags, and many flexible wrappings made of asphalt-laminated papers. Known as "JAN specification adhesives," they are available in 1-gallon, 5-gallon and 55-gallon drums, and in testing samples. Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill., and 630 W. 51st St., New York 19, N.Y.

Continuous Gluing Machine

Simple, low-cost development.

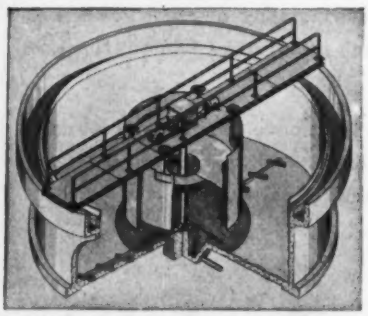


This automatic gluing machine is permanently mounted on a portable stand. The operator controls the speed at which the sheets are fed, or the control can be permanently set to feed the sheets at pre-determined intervals. The unit feeds any weight of paper up to 5 ply index.

Stock is fanned out on the feeding table and tapes convey the sheet to the automatic air wheel which feeds the sheet into the gluing machine. Side guides insure accurate sheet control. An inexperienced operator quickly learns how to control the sheet delivery by use of a foot pedal located in any convenient position. This gluing machine is available in 12 in., 21 in. or 27 in. widths. Potdevin Machine Co., 1285 38th St., Brooklyn, N.Y.

Water Treatment Unit

Adjustable to various processes.

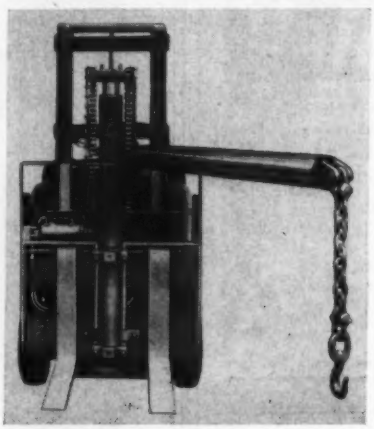


The "American Flocsettler" can be used for mixing and slurry blending, slurry recirculation, sludge blanket settling, sludge concentration, and positive sludge removal. Water or waste enters into the rapid mix and blending zone and then flows through the circulation unit into the flocculation or softening zone. An exclusive principle provides a slight differential between the water surfaces of the blending zone and the quiescent settling zone, thus ensuring positive slurry recirculation. Slurry return can be easily controlled and measured. A slow-speed circulator and gentle velocity currents ensure no violent action to destroy floc structure.

Another feature is a diaphragm separating the sludge concentration zone from the flocculation zone. In the resultant quiescent chamber, slowly moving scrapers squeeze water from the sludge and allow a low-moisture sludge to be removed. American Well Works, Aurora, Ill.

Crane Arm Accessory

Detachable for use on standard fork trucks.



A special development for increased flexibility in loading crated materials in box cars, this "Slewing Crane Arm" permits rapid positioning of loads up to 800 lb. The arm is 80 inches long and is pivoted so that a two-way hydraulic cylinder can swing it laterally 20 degrees to either side of center. The crane arm is readily detachable so that the truck can be used with standard pallet forks. Towmotor Corp., Cleveland, O.

New Product Briefs . . .

▶ SMOKE DETECTOR—For use in air conditioning duct systems, this photoelectric control detects smoke and may, through auxiliary relays (not included), turn off blowers, close automatic shutters and signal the maintenance department. Thus the danger of spreading fire through duct systems is minimized. Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.

▶ WORK GLOVE—The "Dura-Thumb" design, exclusive in work gloves, features one continuous seam on the back of the thumb, insuring more strength where thumb meets palm. A seamless palm also assures flexibility with longer wear. Made of side split pearl grey cowhide with herringbone flannel back and a water-resistant cuff in either 4½ or 2½ inch length. Richmond Glove Corp., Richmond, Ind.

▶ INTERLOCK RECEPTACLE—This unit offers a safety cam lever which locks electric cord plugs in the receptacle, making it impossible to remove the cord while the current is on. A flip of the lever breaks the circuit and allows plugs to be removed from socket. For use on cord extensions where the safety factor is important. Panellit, Inc., 7218 N. Clark St., Chicago 26, Ill.

▶ INSULATION TESTERS—A "Hypot Junior" line of high potential insulation testing instruments has ranges from 0-1500 to 0-6000 volts A.C. with capacities from 40 to 140 volt-amperes. Suitable for production line, random testing, or laboratory use. Associated Research, Inc., 3755 W. Belmont Ave., Chicago 18.

▶ FILTER CLOTHS—A new synthetic filter fabric made of spun-staple (rather than continuous filament) Vinyon-N combines resistance to chemicals and filtering efficiency with a full-bodied, resilient texture that makes the new cloths easy to seal without requiring excessive rim pressures. Filtration Fabrics Division, Filtration Engineers, Inc., 155 Oraton St., Newark 4, N.J.

▶ PALLET TIER ATTACHMENTS—Wood pallets can be adapted for tiering by the "Palteam" parts, consisting of one-piece socket assemblies to be screwed onto the pallets, plus posts of the required length and strength to fit into these sockets and two cross bars to fit over the top of the posts. Paltier Corp., 53 W. Jackson Blvd., Chicago 4.

▶ THERMOCOUPLE GLAND—This bare wire thermocouple gland features rapid interchangeability of all parts to permit the use of any thermocouple wire required. Assembly of gland and wire, and insulation of the wire, are accomplished by sealing the wire with dry powdered talc between two ceramic insulators. Conax Sales Co., Inc., Kenmore 17, N.Y.

▶ GASOLINE VACUUM CLEANER—Designed to provide cleaning for those areas where cost of electric wiring would be excessive, for outdoor areas, or for large plants requiring cleaning in scattered locations, the "Hoffco-Vac No. 50" is gasoline-engine powered. Two sweeper cleaning is provided with 7½ cu. ft. dust container capacity. U. S. Hoffman Machinery Corp., 105 Fourth Ave., New York 3.

▶ NEW MOUNTING FOR GAGE—A traverse mounting for the "Beta Ray Continuous Mill Gage" makes it posible to scan and gage the full width of continuous strip material. Used for controlling edge-to-edge uniformity of sheet rubber, plastic, paper, cloth, etc. Rate of scanning is from 18 in. to 30 in. per minute. Pratt & Whitney, Hartford, Conn.

▶ TRACTION DRIVE WHEEL—The "Trac-Pull" drive wheel is designed for use on bucket elevators; it will not jam, break the chain or slip, when load is not over the maximum. These advantages are due to the design of the "corrugated" rim, replacing the teeth used on sprocket wheels and the smooth rim of conventional traction wheels. Beaumont Birch Co., 1505 Race St., Philadelphia 2, Pa.

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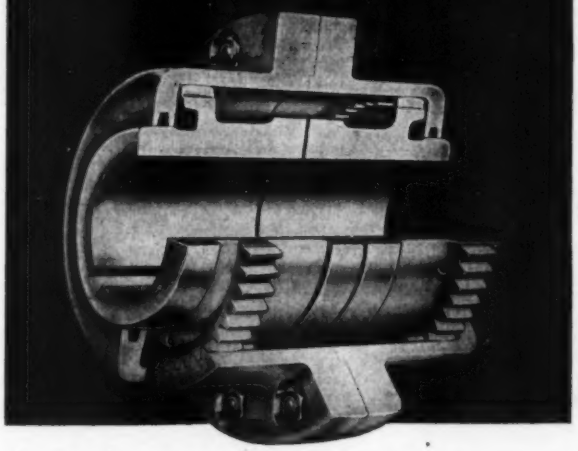

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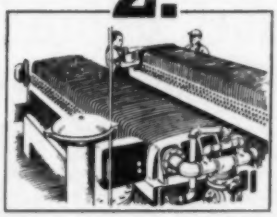
2.



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The Paper Industry New Literature

Books

THE GERMAN CHEMICAL INDUSTRY, a Bibliography of the Chemical, Metallurgical and Process Industries. Compiled by L. Wilson Greene. Published by Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C. 396 pages. $10.00.

This new bibliography, which contains over 2000 document references with descriptive titles or abstracts of captured technology from German chemical, metallurgical and process industries, presents as well general references on postwar conditions in Germany in those industries. Five major classifications on the German chemical industry, including dyes and pharmaceuticals; eleven classifications relating to metallurgy; and twenty concerning the process industries are included.

In addition to a 6000-entry subject index, author indexes, and cross-indexes with O.T.S., British and U.S. Military report numbers, the volume has sections dealing with translations and reports available from private publication services.

CAUSES OF INDUSTRIAL PEACE UNDER COLLECTIVE BARGAINING: Marathon Corp. and Seven Labor Unions. By R. W. Fleming and Edwin E. Witte. Published by National Planning Association, Washington, D. C. 65 pages. 9 x 6. $1.00.

This case study of the relations between the Marathon Corp. and seven labor unions, the eighth in a series prepared for the National Planning Association committee on the Causes of Industrial Peace Under Collective Bargaining, not only presents a complete summary of Marathon's union problems and their solution, but presents in detail the plan and working tools which the company has used to preserve an unusually good relationship with workers and their representative unions.

In order to clarify factors involving industrial peace—or harmonious settlements of differences between management and workers—the authors have used numerous tables and graphs of pertinent factors, with comprehensive summaries of the results of each of the several methods Marathon has considered as solutions to the problems of labor vs. management.

Booklets and Pamphlets

MICA AND MICA SUBSTITUTES—ATTENDANCE AND TRANSCRIPT OF PROCEEDINGS of an industry-military round table discussion, PB 101 142. Published by Office of Technical Services, United States Department of Commerce, Washington 25, D.C. 45 pages. 50c. A number of experts of federal and industrial technical organizations met earlier this year to secure an exchange of opinions on late developments in various materials fields of importance to production of electronic components; this booklet is a report of the findings of that meeting. Subjects covered include solid state synthetic mica, mica research, miniature capacitors, cellulose esters, glass and vitreous enamel insulating materials, dimensionally stable ceramics, use of block talc, integrated mica, and new mica uses.

RESEARCH FOR THE PULP AND PAPER INDUSTRY IN THE SOUTH. Vol. 4, No. 10 of Engineering Progress at the University of Florida. Published by Florida Engineering and Industrial Experiment Station, College of Engineering, University of Florida, Gainesville, Fla. 21 pages. Free. This booklet describes the services offered to the pulp and paper industry by the Pulp and Paper Laboratory at the University. Individual mill problems, or those shared by the entire industry, may be taken to the Laboratory for consultation; the school's Trainee Program, a co-operative enterprise between individual mills and the Laboratory, provides for training mill employees in techniques of research.

INTERNATIONAL COMMUNICATIONS—MESSAGE AND MAIL RATES AND REGULATIONS TO PRINCIPAL WORLD MARKETS. Published by Exporters' Digest, 170 Broadway, New York 7, N. Y. 12 pages. 50c. This newly revised guide presents information on mail, telephone, radio and cable message rates and rules in chart form. The guide includes information on more than 70 countries.

TOWARD WISER USE OF WOOD. Published by the Employees' Association of Forest Products Laboratory, North Walnut St., Madison, Wis. 36 pages. Upon the fortieth anniversary of the Laboratory, its staff has had printed this informal history of the organization which deals in an interesting manner with the broad field of research in forest products. Although the booklet is completely non-technical, it contains information which should be of interest to papermakers.

SINGLE DRUM HOIST BULLETIN. Published by Joy Manufacturing Co., Oliver Bldg., Pittsburgh, Pa. Free. This 16 page publication describes the company's complete line of single-drum, multi-purpose hoists, and includes a "Selecto-o-Hoist" chart which simplifies choice of any hoist needed for a particular use. Complete descriptions and specifications for hoists of 500 to 3500 lb. capacities which are driven by Turbinair, Pistonair, electric or gasoline engines are included.

ALLIS-CHALMERS ELECTRICAL REVIEW. Third Quarter 1950. Published by Allis-Chalmers Manufacturing Co., Milwaukee, Wis. 34 pages. Issued quarterly. Volume 15, No. 3 includes articles on "Take the Switchyard Along," "Predetermining Voltage Distribution in Transformers," "The Betatron Today," "Trends in Power Transformer Application," "Sound Absorption of Panels," and "Transient Operation of D-C Generators."

APPLICATION ENGINEERING DATA SHEETS. Published by Foxboro Co., Foxboro, Mass. Free. Each of the following data sheets is illustrated with diagrams or installation photos to present a clear description and recommendation of the instrumentation most suited for the specific application: No. 260-8, "Raw Green Liquor Flow Control"; No. 260-2, "Automatic Digester Liquor Measuring System"; No. 260-11, "Paper Machine Flat Box Vacuum Control"; and No. 260-12, "Paper Machine Stock Temperature Control."

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.

Mixers and Agitators. Patterson Foundry & Machine Co., East Liverpool, Ohio.—Power mixers, agitators, tank linings, and other related products are covered in catalogue No. 505, titled "Patterson Agitating and Mixing Equipment." Specifications and application information are given. 32 pages.

Catalogue Index. Schutte and Koerting Co., 12th & Thomson Sts., Philadelphia 22, Pa.—A 4-page folder entitled "Index of SK Equipment and Descriptive Bulletins" has been issued to aid prospective users of the heating and blowing systems, pumps, instruments, and parts made by this company. All products are listed according to application and alphabetically, together with the number of the bulletin on each product.

Neoprene Belting. Baldwin Belting, Inc., 74-76 Murray St., New York 7, N.Y.—A single catalogue page describing brown and white "Supertex" belting for light conveying. Specifications for possible installations are given.

Pump. De Laval Steam Turbine Co., Trenton 2, N.J.—Bulletin No. 1001, 8 pages, is devoted to the new "Type GS" pump. Outstanding feature is the removable rotor assembly; which enables the user to eliminate

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A right angle unit built for heavy duty performance in any industry. The worm can be above or below the gear. Shafts are single or double extended for coupling connections or chain or gear drives.

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Bulletin No. 68 covers selection tables and dimensions.

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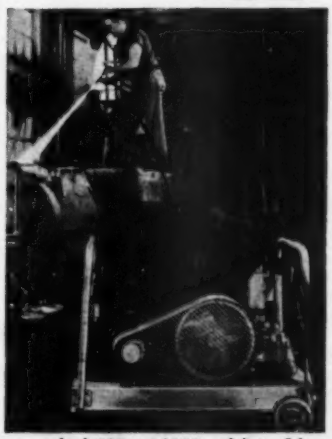

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repairs by simply replacing the old rotor with a new one, receiving credit for usable parts in the old one. All other features and pump sizes and capacities are described.

Speed Reducers. Falk Corp., Milwaukee 8, Wis.—Four bulletins, 24 pages each, give complete and indexed information on the following four types of speed reducers: Bulletin No. 1110—Sleeve Bearing Reducers; Bulletin No. 1115—Roller Bearing Reducers; Bulletin No. 2105—Horizontal Right Angle Reducers; Bulletin No. 2110—Vertical Right Angle Reducers. Part of a series; other bulletins cover smaller sizes.

Piping. Michigan Pipe Co., Bay City Mich.—Three Engineering Bulletins and an introductory guide to piping manufactured by this company are handsomely bound in a comprehensive folder describing uses and properties of five types of pipe and tubing. These are: wood stave, wood lined, saran rubber lined, stainless steel, and monel metal.

Motor Bearings. Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland 10, O.—Bulletin B-2201, 4 pages, discusses advantages of this company's pre-lubricated bearing design, which is said to provide more hours of operating life without relubrication than any other pre-lubricated bearing. Descriptive sketches and cutaway drawings are included.

Dryer Felts. Asten-Hill Mfg. Co., Philadelphia, Pa.—4-page bulletin, "The Why and the Wherefore of Asten Dryer Felts," describes and lists advantages of Asten felts, woven of asbestos and cotton for greater absorbency. For use on machines making all grades of paper.

Trucks and Tractors. Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.—"Clark Materials Handling Equipment," 8 pages is a condensed catalogue containing basic specifications of Clark's entire line of materials handling equipment, including forklift trucks, towing tractors, tructractors and attachments. Easy-to-read large type and simplified tables are features.

Valve Sprocket Rim. Babbitt Steam Specialty Co., New Bedford, Mass.—A small folder, "Babbitt Adjustable Sprocket Rim with Chain Guide," tells how inaccessible valves can be turned on and off with this attachment. Pictures show how the Sprocket Rims are attached to valve hand-wheels and turned by a specially designed chain. Sizes and prices are quoted.

Battery Charger. Hertner Electric Co., 12690 Elmwood Ave., Cleveland 11, O.—Bulletin No. 205 announces the "Unitized" charger, consisting of a motor-generator and a generator control panel with one or more battery charging panels. Designed to facilitate charging electric truck batteries, the switchboard will charge lead-acid or nickel-alkaline batteries in 7 to 8 hours. The unit is pictured in two views, showing dead front and wired back.

Vibration Absorbers. B. F. Goodrich Co., Akron, O.—Four-page Bulletin No. 7290 gives details of parts and installation of "Vibropad," a vibration absorption kit for heavy machines. The booklet tells how these parts can be installed by the machine owner, and describes advantages and certain limited usages of the pads.

Intercom Telephones. Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago 7, Ill.—"Idealfone Systems" is the title of this 8-page booklet describing four types of intercommunication telephone systems to be used without a switchboard. Handsets are illustrated and diagrams of the four types of service are given. Push-button signalling and other new and convenient features are described.

Blueprint Pre-Coat. Merrimac Div., Monsanto Chemical Co., Everett, Mass.—An illustrated booklet discusses Mertone WB-2, a pre-coat for blueprint papers. Properties of the product which obtain greater color depth and tone are outlined, and suggested installations of a pre-coat attachment for slow-speed and high-speed coating machines are given.

Steam Generators. Foster Wheeler Corp., 165 Broadway, New York 6, N.Y.—This 16-page booklet, titled "Dual Circulation," describes the dual circulation steam generator built by this company to replace conventional boilers where steam purity is of great importance. All other important features are covered, and a bibliography of articles and bulletins on this new process is given.

White Enamel. Prufcoat Laboratories, Inc., 63 Main St., Cambridge, Mass.—This 4-page bulletin is on "BX-White Enamel," a liquid plastic that is said to stop corrosion and is guaranteed to stay white. Many other features are described.

Filters. Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N.J.—An 8-page booklet describes the complete line of Titeflex filters, giving detailed information on sizes, capacities and motors. The complete operating cycle, including the backwash system which permits cleaning without manual labor, is told with illustrations.

Plastic Resin. B. F. Goodrich Chemical Co., 324 Rose Bldg., Cleveland, O.—A 16-page booklet, "Geon Polyvinyl Materials," gives basic specifications of the Geon resins manufactured by this company, and suggests many applications in the plastics industry. Among these are coatings, floor coverings, wire insulation, and plasticizers.

Water Filtration. R. P. Adams Co., Inc., 220 E. Park Dr., Buffalo 17, N.Y.—Methods and equipment for industrial water filtration are illustrated and compared in detail in a 20-page bulletin, No. 691. Pressure filtration systems are diagrammed, and equipment such as continuous automatic backwashing systems and the Poro-Screen, Poro-Stone and Poro-Carbon filters are described.

Gear Drives. Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.—Book No. 2247, 16 pages, plus separate price list and order sheet, describes Gearmotors, Motogears and Helical Gear Drives for a variety of applications requiring either integral type or coupled drives. Complete tables of load classifications and dimensions are given.

Roll Clamp. Towmotor Corp., 1226 E. 152nd St., Cleveland 10, O.—Release No. DR-19, one page, is on the newest Towmotor attachment, the revolving roll clamp which will grip a heavy roll and rotate it 360 degrees in either direction. Features such as positive grip and detachability are described.

Pump Control. Fischer & Porter Co., Hatboro, Pa.—4-page Bulletin A-8A-4 details the working of the "Ori-Flowrator" pump sequence control system, designed to start and stop pumps automatically as the flow demand changes. For use in petroleum and chemical plant loading operations.

Pulper. E. D. Jones & Sons Co., Pittsfield, Mass.—Bulletin EDJ-1019B, 6 pages, covers the patented four-way action pulper of this company. Known as the "Pulpmaster," it is shown in various sizes and models and in an exploded drawing showing all working parts.

Electric Hoists. Northern Engineering Works, Chene at Atwater, Detroit, Mich.—8-page booklet E-312 shows various types of "Hi-Lift" hoists and cranes, for heavy loading and handling. Details of design and construction are shown in close-up and subassembly views. Tables of capacities and spans for hoist cranes are given.

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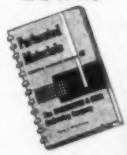

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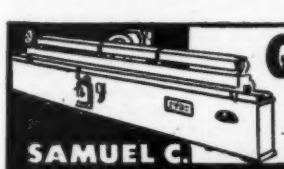

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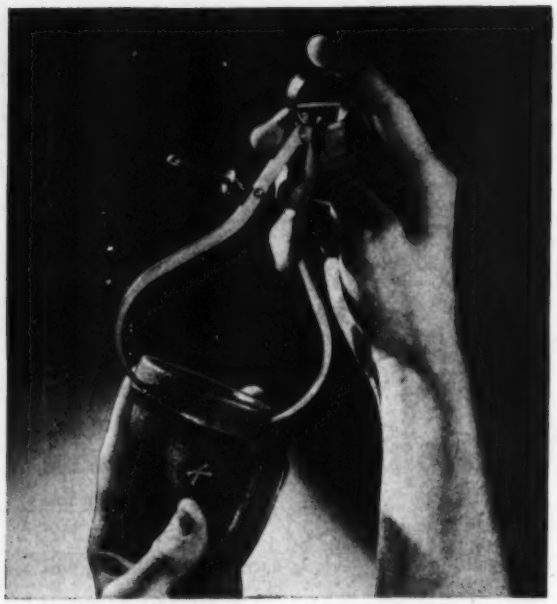

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	per cwt.
Blue Overalls	12.00 to 12.50
Corduroy, Men's	5.50 to 5.75
Corduroy, Ladies'	5.50 to 5.75
Washables, No. 1	5.50 to 5.75
Percales	10.25 to 10.75
Light Prints, No. 1	9.00 to 9.50
Khaki Cuttings—	
Bleachable	8.50 to 9.00
Unbleachable	7.50 to 8.00
New White Canvas	17.00 to 17.50
Canton Flannels, Bleached	18.00 to 18.50
Canton Flannels, unbleached	16.00 to 16.50
Shirt Cuttings—	
New White No. 1	18.00 to 19.00
White Shrunk	17.00 to 17.50
Silesias No. 1	11.50 to 12.00
New Unbleached	18.00 to 19.00
Fancy	8.00 to 8.50
Linen Cuttings—	
American	11.00 to 11.50
White	19.00 to 20.00
Grey	18.50 to 19.50

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	2.35 to 2.45
No. 2	2.25 to 2.35
No. 3 and 4	2.05 to 2.25
Twos and Blues—	
Repacked	3.65 to 3.85
Thirds and Blues—	
Repacked	3.25 to 3.50
Miscellaneous	2.75 to 3.00
Whites, No. 1—	
Repacked	5.00 to 5.25
Miscellaneous	3.75 to 4.00
White, No. 2—	
Repacked	3.75 to 4.00
Miscellaneous	3.25 to 3.50

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

Gunny No. 1—	per cwt.
Foreign	7.00 to 7.50
Domestic	8.00 to 8.50
Wool Tares—	
Light	7.00 to 7.50
Heavy	7.50 to 8.00
No. 1 Scrap Bagging	6.50 to 7.00
Manila Rope—	
No. 1 large	6.50 to 7.00
No. 1 small	5.50 to 6.00
Sisal Rope—	
No. 1 large	6.00 to 6.50
No. 1 small	5.50 to 6.00
New Burlap Cuttings	7.50 to 8.00
Jute Threads—	
Foreign (Nom.)	7.50 to 8.00
Domestic	7.50 to 8.00
Strings—	
No. 1 sisal	5.50 to 5.75
No. 2 sisal	5.00 to 5.25
Soft jute	5.25 to 5.50
Mixed	3.50 to 3.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

Shavings—	per ton
Hard White Env. Cuts	185.00—
Hard White, No. 1	165.00—
Soft White No. 1	130.00 to 140.00
Soft White, one-cut	150.00 to 160.00
Soft White, Misc.	120.00 to —
Fly Leaf, No. 1	70.00 to 75.00
Fly Leaf, Woody No. 1	55.00 to 60.00
No. 2 Mixed Col. Woody	45.00 to 50.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	45.00 to 50.00
Mixed Books	22.50 to 25.00
Ledger Stock—	
No. 1 White	95.00 to 105.00
No. 1 Mixed (Colored)	65.00 to 75.00
Manilas—	
New Env. Cuttings	115.00 to 125.00
New Env. Cuts, One-Cut	—
Extra Manilas	65.00 to 70.00
Manila Tab Cards, Free of Ground Wood	125.00 to 135.00
Colored Manila Tab Cards	85.00 to 90.00
Kraft—	
New Envelope Cuttings	140.00 to 150.00
Tripled Sorted No. 1 100%	70.00 to 75.00
No. 1 Old Assorted	60.00 to 65.00
News—	
White Blank	95.00 to 100.00
Overissue	37.50 to 40.00
No. 1 Folded	30.00 to 32.00
Old Corrugated Containers	37.00 to 39.00
New Jute Corrugated Cuts	38.00 to 40.00
Mill Wrappers	27.00 to 29.00
Box Board Chips	25.00 to 27.00
No. 1 Mixed Paper	25.00 to 27.00

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.05—
Ground, cwt.	3.80—
Powdered, cwt.	4.30—
Blanc Fixe—	
Pulp, bulk, ton	80.00—
Dry, barrels	85.00—
Bleaching Powder—	
Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	37.00 to 38.00
Argentine, lb.	34.50 to 35.50
China Clay—	
Domestic Filler	
Bulk (mine) ton	10.00 to 15.00
Domestic Coating	
Bulk (mine) ton	15.00 to 25.00
Imported (ship side)	
Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.80 to 3.05
Gelatine (silicin), lb.	1.25 to 1.34
Glye, (C.P.) drums, lb.	.50 to .55
Litharge, powd. bbl. lb.	.17¾ to .18¾
Rosin (Gum)—	New York, per 100 lbs.
E	9.00—
F	9.00—
G	9.10—
WW	9.60—
Rosin (Wood), carlots, F.O.B. South	6.80—

MARKET QUOTATIONS

Salt Cake—
Dom. bulk (wks) ton..... 22.00 to 24.00
Imp. bulks on dock—
(Atl. ports) ton (Nom.) 25.00—

Soda Ash—
Bulk (works) cwt..... 1.20—
Paper Bags, cwt..... 1.50—

Soda (Caustic)—
Solid drums, cwt..... 3.35 to 3.40
Ground and flake, drums, cwt. ..... 3.75 to 3.85

Sodium Silicate—
40 deg 55 gal. drums, (works) cwt..... 1.55 to 1.75
40 deg 35 gal. drums, (works), cwt..... 1.20 to 1.35

Starch—
Pearl, 140 lb. bags, cwt... 5.62—
Pearl, barrels, cwt..... 5.62—
Paper, (Sp.) bags, cwt..... 5.62—
Powdered, barrels, cwt..... 5.73—

Sulphur (Crude)
(Mine) bulk, long ton..... 22.00—

Talc—
Dom. 100 lb. bags (mine) ton ..... 25.00 to 28.00
Canadian ..... 35.00 to 45.00

Titanium Dioxide—
Barium Pig, bbls., lb..... .19½ to .21½
Calcium Pig. bbls., lb..... .19½ to .21½

Zinc Sulphide, bbls., lb. ..... 11.50 to 11.75

WOOD PULP

Prices, dollars per short, air dry, ton, with inland freight allowed, are:

Bleached sulphite, Swed. 160.00—
Bleached sulphite, Finnish —
Bleached sulphite, dom.....128.00 to 135.00
Easy bleaching sulphite.... —
Unbleached kraft, Finn..... —
Unbleached sulphite, Swed. 138.00 to 160.00
Unbleached sulphite, Fin... —
Unbleached sulphite, dom...117.00—
Unbleached kraft, Swedish 138.00 to 160.00
Unbleached kraft, northern 110.00 to 120.00
Unbleached kraft, southern 115.00—
Bleached sulphate, Swedish 160.00—
Bleached soda, domestic....130.00—
Sulphite screenings, dom... 40.00 to 50.00
Groundwood, domestic and Canadian ..... 75.00 to 80.00

PAPER

f.o.b. New York City

Boards— per ton
Binders ..... 125.00—
Chip ..... 95.00 to 100.00
Chip, tube and can..... 105.00—
Chip, full blending..... 107.50—
Chip, sgl. mla. lined..... 120.00—
Coated, white patent
.016 ..... 145.00—
.020 and heavier..... 135.00—
Kraft liner..... 115.00—
Filled News..... 97.50 to 102.50
Container ..... 115.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)
Uncoated (Untrimmed)

Book, White (M. F.)—
A Grade E. F..... 16.15—
B Grade E F..... 15.40—
A Grade S. C..... 16.65—
B Grade S. C..... 16.15—
No. 2 Uncoated Offset 4 sides, White —

Machine Coated White
No. 1 Glossy..... 21.65—
No. 2 Glossy..... 20.40—
No. 3 Glossy..... 19.65—
No. 4 Glossy..... —
No. 2 Offset..... 16.90—
CIS Litho (Varnish)..... —
CIS Litho (Non-Varnish)..... —

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—
(In Ton Lots)

	per cwt.
Extra 100% Rag.....	64.55—
100% Rag	56.95—
75% Rag	43.70—
50% Rag	35.60—
25% Rag	29.75—

Rag Content Ledger—
(In Ton Lots)

	per cwt.
Extra 100% Rag.....	66.35—
100% Rag	58.20—
75% Rag	44.95—
50% Rag	36.95—
25% Rag	31.00—

Sulphite Bond—

	per cwt.
Air dry, watermarked	—
No. 1 watermarked.....	18.30—
No. 2 watermarked.....	17.25—
No. 4 watermarked.....	16.25—

Sulphite Ledger—

	per cwt.
No. 1 watermarked.....	20.30—
No. 2 watermarked.....	20.15—
No. 4 watermarked.....	19.60—

Glassine (f.o.b. mill)—

	per cwt.
Embossed (25 lb. up).....	—
Bleached (25 lb. up).....	—
Unbleached (25 lb. up)...	—
Greaseproof—	
Bleached (25 lb. up).....	—
Unbleached (25 lb. up) ..	—

News—

	per ton
Rolls, Standard (Contract)	100.00 to 110.00
Rolls (Spot)	(Nominal)
Sheets	120.00—

Tissues (Carlots)—

	per ream
White No. 1.....	1.75—
White No. 2.....	1.55—
Bleached Anti-Tarnish.....	—
Colored	—
Anti-Tarnish Kraft.....	1.60—
Manila	1.75—
Napkins, semi-crepe (12¼ lb. to M shts.) per cs.	.90—
Napkins, full crepe and emb'sed (12¼ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M. shts.) per cs.....	7.10—
Toilet, Unbleached (M shts.) per cs.....	5.90—

Towels—

	per case
Bleached	6.65—
Unbleached	5.65—

Wrappings (Kraft)—

	per cwt.
Super-Standard	8.75 to 9.00
No. 1 Wrapping.....	7.75 to 8.00
Standard Wrapping	7.00 to 7.25
Standard Bag	6.75 to 7.00
Variety Bag.....	—

Wrappings (Sulphite and Bleached Kraft)—
(Rolls, f.o.b. mill)

Bleached Papers—

	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only)	—
(10,000 lb.)	—
Drug wrapp., 25 lb.....	—

Unbleached Papers—

Com. Gr. Butch. 40 lb.	—
No. 1 Butchers.....	—
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.....	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb. ..	—

Manilas—

Envp. Mla., Sub. 16-40 (No. 1).....	—
Envp. Mla., Sub. 16-32 (No. 2)	—
Envp. Mla. (Prices based on large sheets untrim'd ream marked, in bdls.)	—

Wrapp Mla. 35 lb. up—

No. 1	9.00—
No. 2	—

M.G. Sulphite and Kraft (other than Waxing)

Grade B30 lb.	—
Grade A-22 lb.	—

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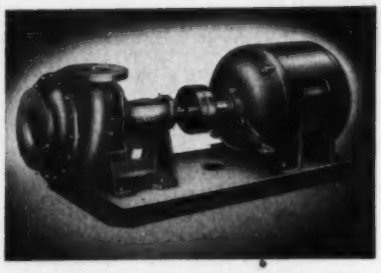

Fig. 3169, single stage, open impeller centrifugal

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This new and extremely successful line of centrifugals is now available in 10 sizes. You can now take advantage of the efficiency of this new design to fill your pumping needs in a wide variety of applications.

APPLICATIONS: Goulds designed the Fig. 3169 especially for general water service, irrigation, Slurries, circulation, transfer and factory wastes. It also gives excellent service in air conditioning, plumbing, heating, processing and related applications.

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CAPACITIES: Fig. 3169 is made in 10 sizes for both motor and belt drives. Capacities to 1000 G.P.M. with heads to 180 ft., depending on capacity.

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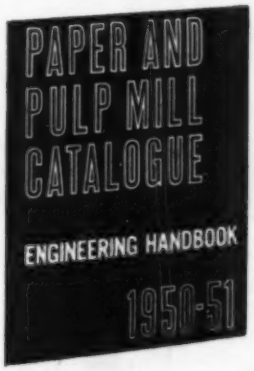

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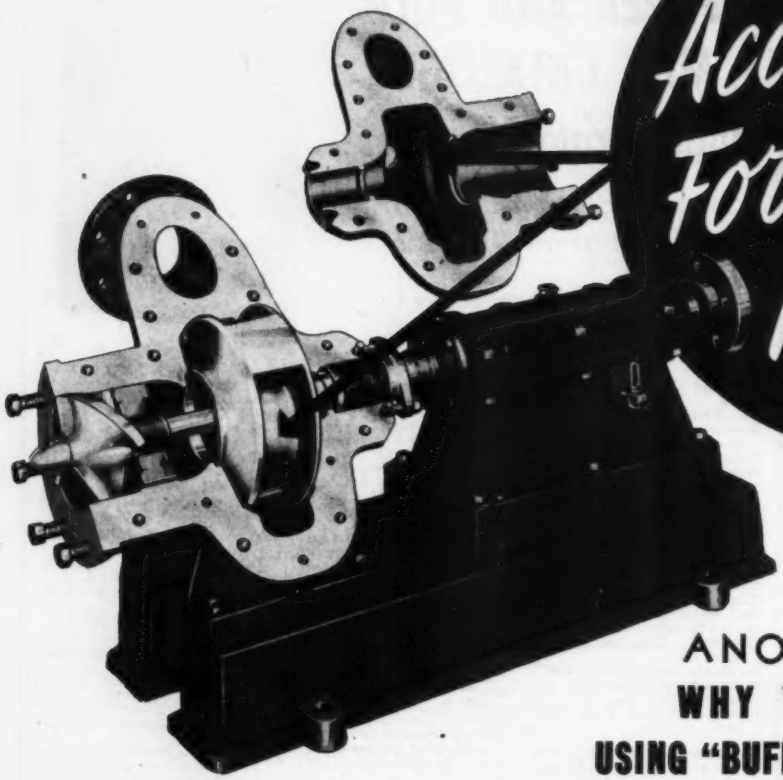

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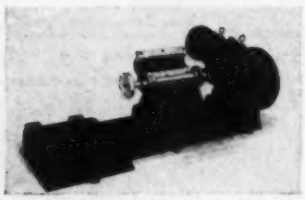
ANOTHER REASON WHY YOU SAVE MONEY USING "BUFFALO" DS* STOCK PUMPS



Bearing Cover Also Readily Removable
Above, showing "Buffalo" Rubber-Lined "DS" Pump with bearing cover removed. Note rugged construction throughout.

"Buffalo" Diagonally Split-Shell* Paper Stock Pumps save many production hours and maintenance hours through this convenient feature. Upper half of pump casing can be removed without disturbing discharge piping, just by removing a few bolts. Paper mill men appreciate this in working with high-consistency stock. They also appreciate the rugged construction—the lasting efficiency—the non-clogging design of "Buffalo" DS Pumps.

WHY NOT WRITE FOR YOUR FREE COPY of Bulletin 953-G for all the facts on this and other proven "Buffalo" Pumps for every stock and every consistency?

BUFFALO PUMPS, INC.
213 MORTIMER ST BUFFALO, NEW YORK
Canada Pumps Ltd., Kitchener, Ont.

WESTMINSTER *uses* BECCO H_2O_2

IN

COLD STEEP BLEACHING

Upper pipe and brush support

Upper bleach liquor distributor pipe

Upper nylon brush for spreading liquor

Through the cooperation of Westminster Paper Co., Ltd., BECCO has completed the mill development work and commercial application of this new high density process, now in its 18th month of successful use.

The new process permits bleaching of groundwood pulps to brightnesses as high as 70-74 . . . at highest chemical efficiency on the simplest sort of equipment. Pulp mixers, retention equipment, and post-neutralization are eliminated.

The simplicity of the process is shown by the picture, taken in Westminster's mill in New Westminster, B.C. A 2-roll padder transfers Hydrogen Peroxide bleach liquor of controlled alkalinity to one or both sides of a high density web. Then the rolls (or sheets) are stored for two or more days at the mill or in transit and thereafter are ready for paper furnishing.

Simple adjustments of formula adapt the new BECCO process for equally efficient bleaching of sulfites, semi-chemicals or semi-bleached krafts.

Send for literature on the new BECCO Cold Steep Bleaching process or on other uses of BECCO Peroxygen chemicals. BECCO SALES CORPORATION, Sales Agent for BUFFALO ELECTRO-CHEMICAL COMPANY, INC., Buffalo 7, N. Y. • Buffalo • Boston • Charlotte Chicago • New York • Philadelphia

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Please send me literature on:

(P-2) . . . BECCO COLD STEEP BLEACHING PROCESS

(P-1) . . . Pulp Bleaching with Hydrogen Peroxide

(P-3) . . . Peroxide De-inking

(P-4) . . . Glassine Bleaching

(P-5) . . . BECCO Laboratory Bleaching Methods

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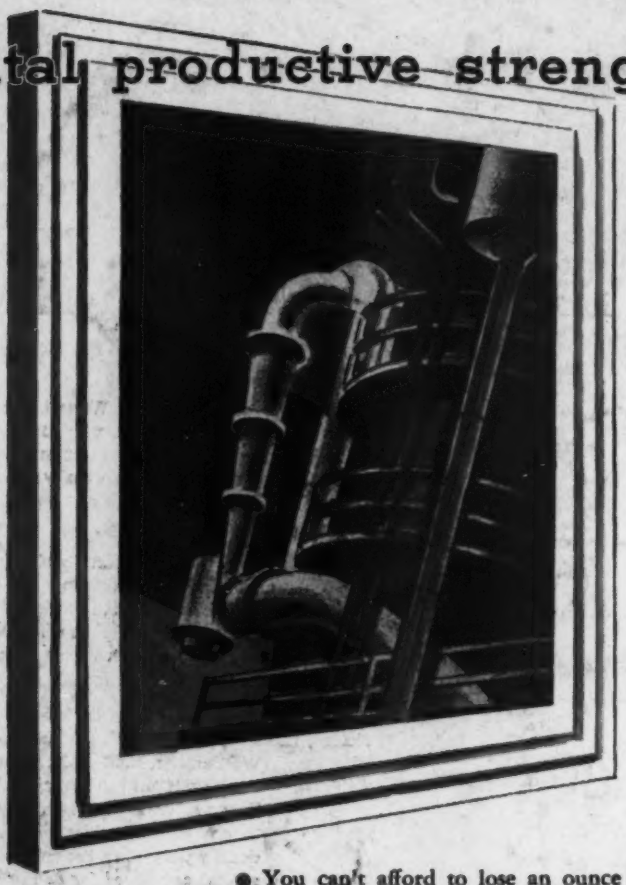
vital productive strength



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iron valves

Fig. 1430

● You can't afford to lose an ounce of productive power, these days — and neither can we.

It's industry's job to keep strong and fit . . . to support a healthy, sound economy, and be ready to move with the times.

Your strength — and ours — deserves the best equipment we can buy to maintain it. Substitutes won't do. And the productive strength that flows through your piping installations is *best* conserved with Lunkenheimer valves.

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The leading industrial distributor in your area will be glad to give you full information on the complete Lunkenheimer iron line. Ask him to show you how Lunkenheimer valves will meet *your specific* application problems . . . protect your productive capacity.

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